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the Iron Age

E NATIONAL METALWORKING WEEKLY

February 4, 1954

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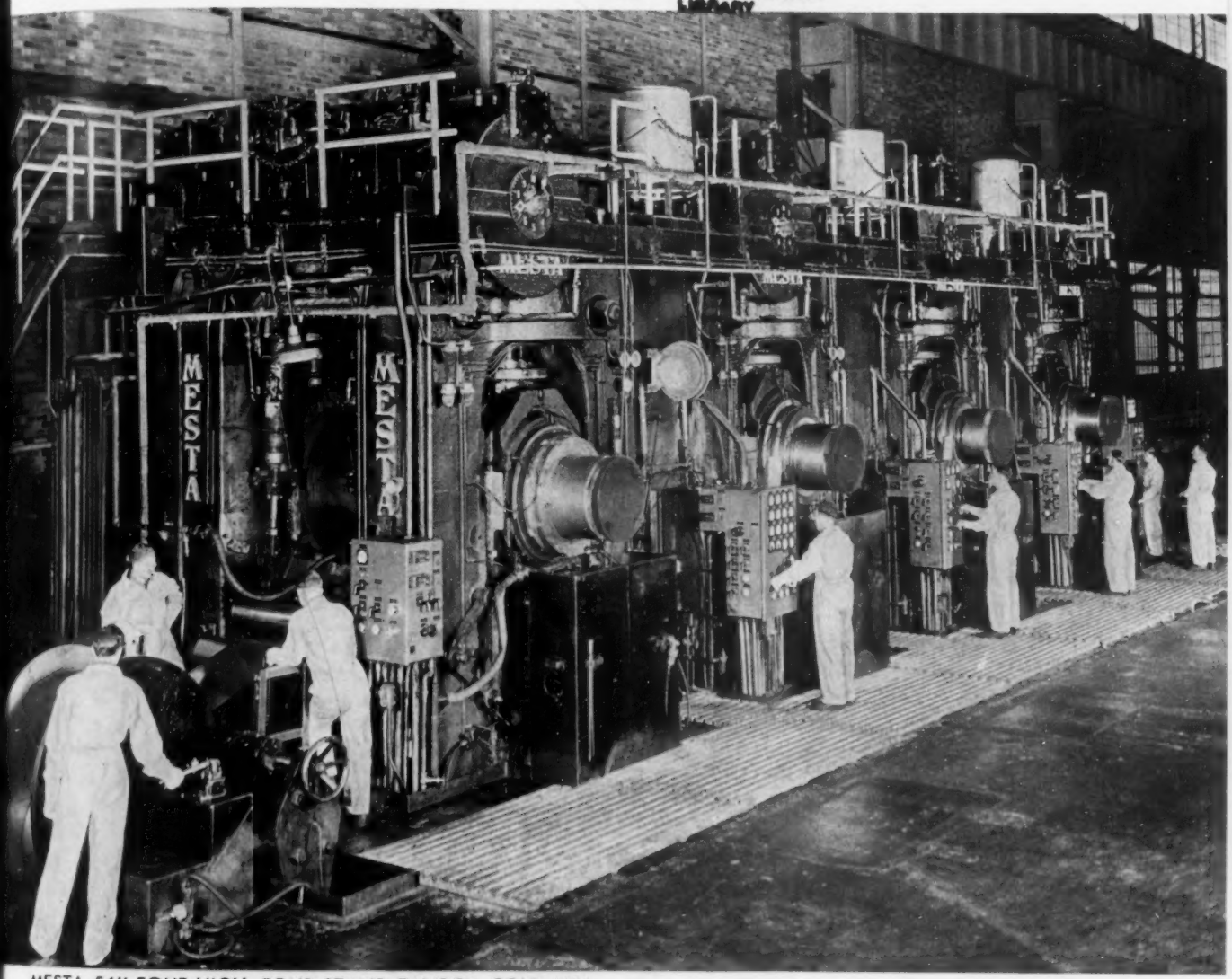


MESTA 56" FOUR-HIGH, FOUR-STAND TANDEM COLD MILL

NEW

ROTOR PENCIL AIR GRINDER

FOR DIES · PATTERNS · 1001 GRINDING JOBS

40,000 R.P.M.

POWERFUL!

Only 13 ounces

Handy

Rugged–Steel

SPECIFICATIONS

WEIGHT	13 ounces
LENGTH	5 3/4"
DIAMETER	1"
FREE SPEED	40,000 R.P.M.
COLLET	1/8" or 1/4"

Equipment (Standard)

8 ft. hose and air strainer. Push throttle. Collet wrench. 1/4" collet.

Equipment (Optional)

1/8" collet chuck

Steel rear head. 1/8" air inlet.

Steel rear head. (right angle). 1/4" inlet.

Tool post holder (extra cost).

AIR

HIGH CYCLE

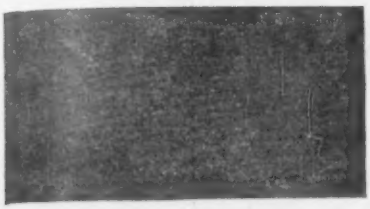
THE **ROTOR TOOL** CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

Tests show MAYARI R holds paint 20% to 80% longer

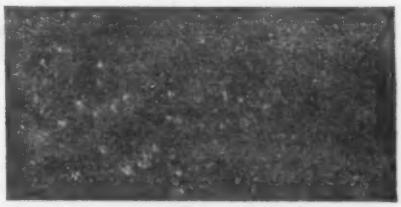
A comprehensive series of tests was run to determine the relative paint-adherence of Mayari R steel and ordinary carbon steel. Five specimens of each of these steels in 4-in. by 4-in. by 1/4-in. angle sections with typical partly rusted scale surfaces were wire-brushed, and each given a coating of one of five different types of primer paint at a uniform dry film thickness of 2.5 mils. These painted sections were then placed at a 45-degree angle in a corrosive industrial atmosphere. After the specimens had been exposed under identical conditions for the same period of time, adherence results were as shown below.



MAYARI R **PRIMER A** CARBON STEEL

Special zinc chromate, linseed oil; synthetic resin primer

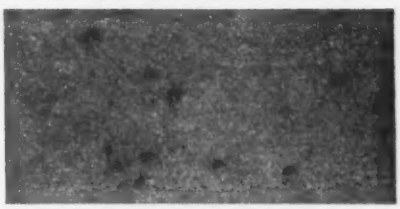
This primer lasted 80 pct longer on Mayari R (left) than on carbon steel (right).



MAYARI R **PRIMER B** CARBON STEEL

Red lead; linseed oil primer

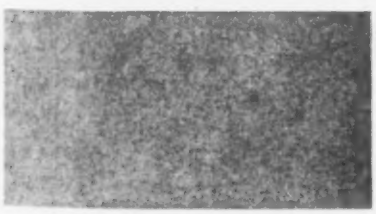
Mayari R (left) showed 20 pct longer paint life than did carbon steel (right), both coated with this primer.



MAYARI R **PRIMER C** CARBON STEEL

Red lead, iron oxide, linseed oil; synthetic resin primer

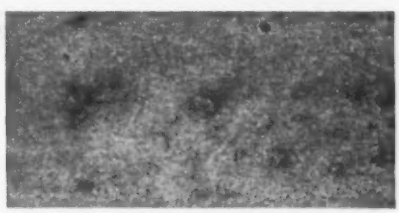
With this primer, Mayari R (left) retained its coating 35 pct longer than carbon steel (right).

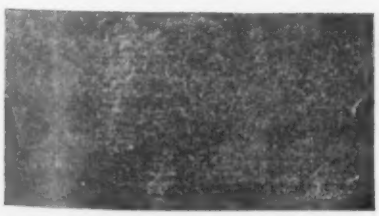


MAYARI R **PRIMER D** CARBON STEEL

Red lead, iron oxide; synthetic resin primer

Mayari R (left) proved to have 35 pct greater paint adherence than carbon steel (right) when this primer was used on both.





MAYARI R **PRIMER E** CARBON STEEL

Zinc chromate, linseed oil; synthetic resin primer

When this primer was used, Mayari R (left) proved to have 75 pct longer paint life than carbon steel (right).

This research investigation, confirmed by the experience of Mayari R users in many industrial applications, shows how important savings in paint and labor are made possible through the use of Mayari R low-alloy, high-tensile, corrosion-resisting steel.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

The Iron Age

Vol. 173, No. 5, February 4, 1954

★Starred items are digested at the right.

EDITORIAL

Mr. Eisenhower Has Not Changed 7

NEWS OF INDUSTRY

★Special Report: Steel's Net Rebounds in '53... 83
★Research: Develop Midget Computer Unit..... 84
Convert Atom Energy to Electricity. 85
★Construction: Housing Will Be Major Prop.... 86
★Marketing: Nonintegrated Mills' Business Slow. 89
★Warehouse Outlook Perks Up ... 90
★Government: Ike Sees Economy Okay 95
★Expansion: Steel Capacity Tops 124 Million Tons 98A
Personnel: Iron Age Salutes 133
Iron Age Introduces 135
Clearing House 212

NEWS ANALYSIS

Newsfront 81
★Automotive Assembly Line 100
★This Week in Washington 105
West Coast Report 109
Machine Tool High Spots 111
★Report to Management 113

TECHNICAL ARTICLES

★Industrial Styling Provides Higher Sales..... 141
★How Does Titanium Machine? 146
★Planning Pays Off in Higher Efficiency 150
★Electrostatic Detearing Improves Quality..... 153
★Get More From Your Surface Plates 156
Technical Briefs 160

MARKETS & PRICES

★The Iron Age Summary—Steel Outlook 185
Market Briefs 187
★Nonferrous Markets 188
Iron and Steel Scrap Markets 192
Comparison of Prices 196
Steel Prices 198

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Publications 115
New Equipment 120

INDEX OF ADVERTISERS 222

THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, $2.00. Cables: "Ironage." N. Y.

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DIGEST of t

NEWS DEVELOPMENTS

STEEL INDUSTRY EARNINGS REBOUND IN '53 — P. 83
Earnings in the steel industry were nearly 50 pct better in 1953 than in 1952. But fourth quarter '53 income dropped 12 pct below the similar '52 period. The sharp improvement comes as no great surprise as the industry did a record business volume. And 1953 production was unhampered by serious strikes.

ARMA DEVELOPS FLYWEIGHT COMPUTER UNIT — P. 84
A research team of Arma Corp. has shrunk the mechanical brain. New component has no moving parts, works by temperature difference. Unit is simple, small, light, rugged and cheap to make. Hundredth-of-a-second operation and accuracy within 1 pct could lead to low cost automation.

CHICAGO TAKES OVER AS NO. 1 STEELMAKER—P. 98A
Industry added 6,782,940 tons of steel capacity in 1953 to bring the total to 124,330,410 tons a year. The Iron Age Chicago district, boosting itself 1.79 million tons, now ranks as the leading steelmaking area. Detroit hiked its electric furnace capacity 26 pct. Only Pittsburgh's capacity sagged.

GM PARCELS OUT ITS EXPANSION BUNDLE — P. 100
Pattern of General Motors' billion-dollar expansion started to become clear last week as divisions outlined to some extent how they are to participate. Largest expenditures are slated for machine tools and plant modernization. Market share is the main basis for allocations to GM's divisions.

PREDICT EMPLOYMENT UPSURGE IN SPRING — P. 105
Industrial unemployment, now estimated at slightly more than 2 million, is beginning to taper off in some areas and may start downward by mid-March. White House economists aren't worried, feel the first half job outlook is favorable generally. But ordnance and shipbuilding may face further layoffs.

HOW ADMINISTRATION POLICY AIDS INDUSTRY—P. 113
Government policy as outlined in President Eisenhower's numerous messages to Congress is soundly designed to stave off recession. Main advantages to industry are better break on depreciation tax policy, end of double taxation on corporation earnings. Good business for steel mill equipment suppliers expected.

the Week in Metalworking

ENGINEERING & PRODUCTION

IMPROVED STYLING BRINGS MANY BENEFITS — P. 141
Styling affects almost all items sold. Even with completely functional parts, pleasing appearance increases saleability. Good styling frequently improves functional qualities. On machine tools, good design promotes worker efficiency and increases pride of workmanship. Styling requires close company planning.

BASIC DATA ON TITANIUM MACHINABILITY — P. 146
Practical information on drilling, reaming and sawing titanium is yours in this final article of a 3-part series. Super high speed drills of the thick web type have given good results. A sulfurized chlorinated mineral oil makes an excellent cutting fluid. Stick to slower speeds in bandsawing for longer blade life.

CONSTRUCTION PLANNING REALLY PAYS OFF—P. 150
More efficiency and better working conditions can be built into your plant by carefully planning each step before construction starts. That's how Ohio Screw Products got more than just a building when it put up a new plant. Layout for most efficient handling has chopped maintenance costs, provided other benefits.

ELECTROSTATIC DETEARING AID TO QUALITY—P. 153
Smooth, uniform coatings are obtained on dip-coated parts by removing paint tears and fatty edges electrostatically. A special electrode arrangement at high potential attracts the paint from drain points in a matter of seconds. Soft paint films, wrinkles and chipping are avoided, rejects reduced to under 1 pct.

GET THE MOST FROM YOUR SURFACE PLATES—P. 156
Demands for greater accuracy in metalworking operations have made the surface plate a widely used shop tool. Where tooling for gaging and checking is not economically practical, the surface plate is invaluable. Make your selections of metal and granite plates with specific jobs in mind, take proper care of them.

NEXT WEEK—SAVE WITH CENTRAL COOLANT SYSTEMS
A central coolant supply system is paying savings dividends at Chrysler's new automatic transmission plant. Applied to 150 grinders it means longer wheel life and better surface finish, plus almost complete recovery of water soluble oil through return pipe lines. No time or labor is lost in cleaning single machines.

MARKETS & PRICES

PLAN HOUSING AS MAJOR '54 ECONOMY PROP—P. 86
White House housing program is aimed at boosting construction levels over last year's record $35 billion. The Administration sees housing as an increasingly important prop to the economy this year, particularly in keeping demand for durable goods high. Among proposals are greater government aid, higher loans.

BUSINESS SLOW FOR NONINTEGRATED MILLS—P. 89
It's a familiar story for the nonintegrated steel producer, and not one to his liking. When times are good his production is limited by the amount of hot-rolled steel he can get; when business is slow he can get all the hot-rolled he wants but not enough customers. Pickup may be in the offing.

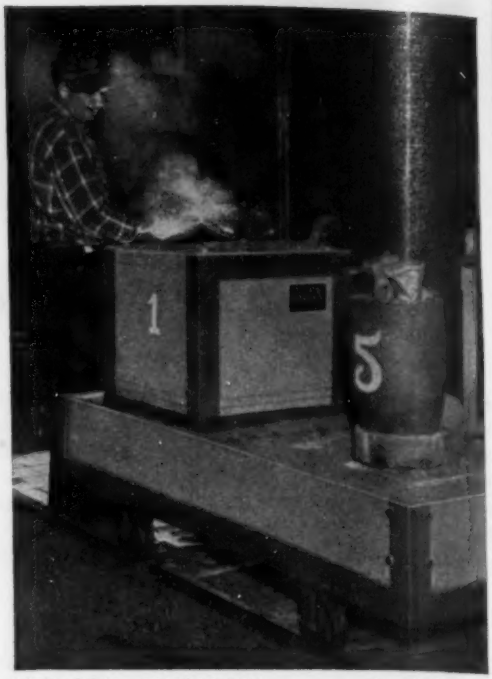
PROSPECTS PERK UP FOR STEEL WAREHOUSES — P. 90
After a buffeting by stormy and changing business weather in late 1953, warehousemen are reporting their stocks adjusted to a slower tempo. With the reports last week came notes of a mild upturn in warehouse sales, with prospects better for February. Inventory bulges have been slimmed down.

IKE SEES NO CAUSE TO WORRY ABOUT ECONOMY—P. 95
Current economic declines are just about over and will shortly have leveled off, if President Eisenhower has correctly interpreted the signs indicated by surveys of his advisers. The President's economic message views the business decline as temporary—but his Administration is ready to help if trouble looms.

EXPECT NO BIG PICKUP IN STEEL THIS SPRING—P. 185
Don't look for any sharp pickup in steel business this spring. The industry is fully competitive, and seasonal factors are again present. Signs of a big increase in steel business are lacking. For one thing steel's biggest customer, the auto industry, is trimming output. But some little customers are back.

SEEK CURE FOR MINING INDUSTRY AILMENTS — P. 188
Leaders of the lead, zinc industry continue fight for survival. Imports, not market conditions, stressed as main unfavorable factor. Urge higher tariffs and tax reforms to keep industry healthy. Oppose majority report of Randall Commission. Big titanium and iron find reported in Wyoming.

THE MOST *Economical* WAY TO MELT *Quality Bronze*



LIFT-COIL FURNACES *can melt different alloys simply by switching crucibles.*

AJAX-NORTHRUP INDUCTION FURNACES

An Ajax-Northrup equipped bronze foundry, melting a wide variety of alloys in lift-coil furnaces, reports 10% higher tensile strength for certain of its induction-melted alloys . . . and has reduced melting costs by over $33.00 a ton at the same time!

Similar performance is reported by users of the larger tilting furnaces. The tilting units are slightly more efficient than the lift-coil equipment, and are used where ability to switch alloys frequently is less important.

If you haven't looked into the possibilities of induction melting for your non-ferrous foundry lately, we'd like to show you some of the data we've gathered from recent installations. Just write or phone us.

TILTING FURNACES *are used for larger quantities, or special production runs.*

149

AJAX NORTHRUP

INDUCTION HEATING AND MELTING

AJAX ELECTROTHERMIC CORPORATION
Ajax Park, Trenton 5, New Jersey

Associated Companies

- AJAX ELECTROMETALLURGICAL CORP.
- AJAX ELECTRIC FURNACE CORPORATION
- AJAX ELECTRIC COMPANY, INC.
- AJAX ENGINEERING CORPORATION

Since 1916

Steel Industry Earnings Rebound in '53

Sharp improvement in steelmakers' profits resulted from record volume, unhampered operations . . . But fourth quarter net reflected a 12 pct decline—*By W. V. Packard.*

Steel industry earnings were nearly 50 pct higher in 1953 than in 1952. But fourth quarter 1953 income dropped 12 pct below the similar period in '52.

These are highlights revealed by an IRON AGE compilation of steel company preliminary financial reports. Included in the compilation are companies accounting for more than 80 pct of the industry's steelmaking capacity.

Sharp improvement in steel industry earnings last year comes as no great surprise because the industry did the biggest volume of business in its history. Most companies had already reported alltime records in sales, production, shipments.

Price Increases Helped

Moreover, 1953 was a year of relatively unhampered production, while operations in 1952 were crippled by a 54-day strike.

Decline in fourth quarter 1953 income compared with the previous year is attributed largely to these two factors: (1) Steel business declined during fourth quarter 1953, and (2) excess profits tax credits boosted fourth quarter 1952 income disproportionately.

Financial results for the year would have been much poorer had it not been for extra and base price increases. Extra prices were advanced more than $5 a ton on the average in April to correct inequities that had arisen while steel prices were under controls. Then, on June 17, base prices were advanced an average of $4.30 per ton to compensate for the seventh round wage increase costing producers about 10¢ an hr.

In spite of price increases, profit margins are still thin. For example, U. S. Steel's income in 1953 was 5.8 pct of sales; in 1952 its income was 4.6 pct of sales. Republic's '53 income was 5 pct of sales compared with 4.8 pct in '52. A decline in volume will tend to raise unit costs and shrink the profit margin, so '54 may see profits dipping again.

No Tears for EPT

A favorable factor not emphasized by the balance sheets is 5-year amortization of steel facilities expanded to support the defense effort. Had it not been for the so-called "fast tax write-off" the accelerated amortization would have shown up as additional taxable profit in the 1953 steel earnings figures.

Another favorable factor that will be felt in 1954 will be the elimination of excess profits tax. The industry's tax bill in 1953 was at an alltime high. The following will give you an idea of the amount of total taxes on income and the portion of it represented by excess profits tax:

Company	Federal Taxes on Income	Excess Profits Tax
U. S. Steel	$325,000,000	$54,000,000
Bethlehem	$161,000,000	$16,500,000
Republic	$100,500,000	$20,200,000

Industry leaders still speak confidently of the outlook for steel business during the first half of 1954—that's as far ahead as most of them are willing to guess. But noticeably lacking were expected predictions of a seasonal pickup this spring.

Consensus seemed to be that steel business would continue through the first half at about its present clip. That would mean an operating rate in the neighborhood of 75 pct of rated capacity which is now 124,330,410 net tons, compared with '53's 117,547,470 tons.

This is a little less bullish than steel spokesmen had been toward the end of last year. It also bears out THE IRON AGE'S contention that first quarter steel business has so far been disappointing, and there is unlikely to be any sharp spurt in the ingot rate. Production cutbacks by automakers were knocking the blocks from under the extreme optimists.

Steel Company Earnings—1953 and 1952

Company	1953 12 Months	1952 12 Months	Fourth Quarter '53	Fourth Quarter '52
U. S. Steel	$222,735,656	$143,687,746	$56,012,628	$48,126,916
Bethlehem Steel	133,947,837	90,900,771	40,422,497	49,479,066
Republic Steel	56,743,547	44,274,053	13,984,990	22,853,905
Jones & Laughlin	31,015,000	19,482,000	5,845,000	14,071,000
National Steel	50,334,130	37,559,477	.....	.....
Youngstown	30,839,716	22,915,822	7,837,819	11,864,358
Armco Steel				
Inland Steel	33,867,184	23,755,218	9,817,867	7,615,464
Colorado Fuel & Iron	4,864,505*	2,604,146*	2,380,708	2,026,246
Wheeling	12,458,311	10,950,780	.....	.....
Lukens Steel †	3,607,713	2,316,791	.....	.....
Alan Wood Steel	3,214,000	2,251,073	.....	.....

* = 6 mos.
† Fiscal year ended Oct. 24.

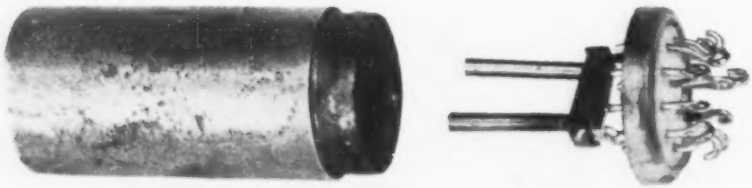
COMPUTER: Develop Flyweight Unit

Arma Corp. research team shrinks mechanical brain . . . Unit is simple, cheap, rugged . . . Uses no moving parts . . . Could pave way to low cost automation—*By R. L. Hatschek.*

HEAD of Arma's research group, Dr. Paul H. Savet is credited with development of the miniature computer.

Think of a mechanical brain and you usually visualize a room-sized monster of complexity. Simpler units used for control devices and similar purposes are much smaller. But cramming them into aircraft is an eternal battle for space and cost of using them for industrial automation is still prohibitive in many cases.

Miniaturization gives way to sub-miniaturization in a new analog computer element. Size, complexity and cost all fall to the knife of simplification in this development by an Arma Corp. research team headed by Dr. Paul H. Savet. Elimination of all moving parts results also in a rugged, dependable unit. About the size of a standard vacuum tube, it may be plugged into a circuit in the same way.



FULL SIZE picture of the midget computer element. Works (right) fit into oversize can which is filled with powdered mica for heat and shock insulation. It would be possible to use waste space for a transistor amplifier.

Power Needs Small

What will it do? It can add, subtract, multiply, divide, integrate and handle basic operations of vector algebra and vector calculus as well as other mathematical problems. Time required for a single operation is about a hundredth of a second—20 times as fast as the quickest human reaction.

While amplifiers for other types of computer components may also be transistorized, the smaller power requirement of the Arma type lends itself more easily to miniaturization in this direction. Reason is that power transistors are still somewhat limited. This would further cut space, weight and power needs.

Error of the present version is stated to be within the range of ½ to 1 pct. It is possible to improve this accuracy considerably but in many applications a computer's speed is far more important than its accuracy.

Temperature Range Wide

Yet another advantage of what Arma calls its "hot midget mathematician" is that it works independently of the frequency of electrical current. Direct current may be employed or one frequency of alternating current may be put in and another taken out.

The component is based on the heating properties of an electric current, variation of the resistance of most metals depending on their temperature, and the ability of a Wheatstone bridge to detect the slightest variation in electrical resistance. Feedback amplification speeds the reaction time.

In addition to saving as much as 75 pct in space and weight, the unit will function over a wide temperature range. This is so because it operates on the temperature differential and is independent of absolute temperature within the range of materials from which it's made.

Two basic limitations do exist, neither very serious. Self-heating introduces an error on the order of 1/10 of a pct and electrical noise, such as static, limits sensitivity to about 5 millivolts on a signal of 10 volts. The noise level limitation is common to all other computer types available today.

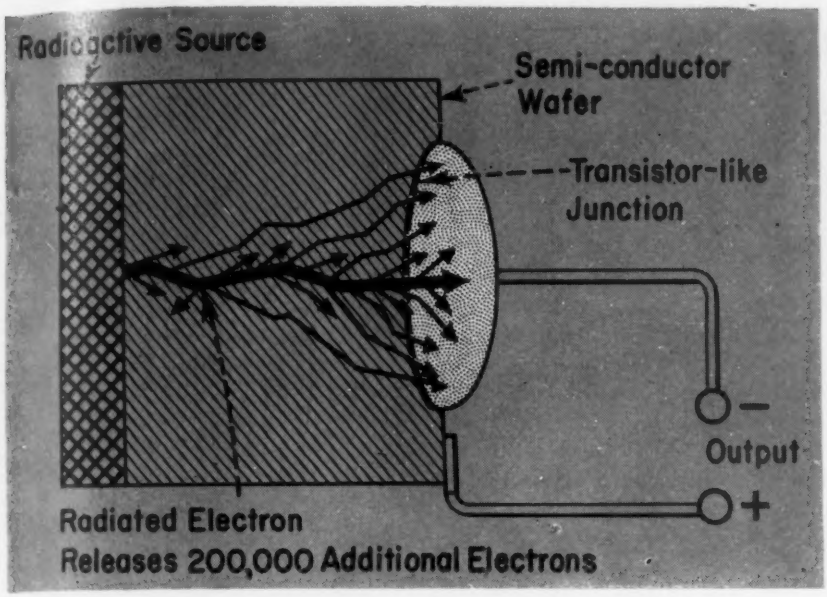
Too Early to Talk

Production of these units would be quite simple — particularly when compared with existing mechanical analog computers — and cheap. No unusual materials are required. Very small Nichrome wire filaments are used to heat nickel wire elements.

Though it's already being utilized in several secret applications, Arma feels it's still too early for specific predictions. Aviation seems likely to be among the first to take advantage of the new unit. Accuracy is adequate for most of the computations needed in piloting an airplane. Navigational computers, bomb-sights and such secondary instruments as angle of attack indicators would be logical spots for the midget.

And on top of the other advantages, low cost of the unit may open new doors for growing industrial automation.

It's theoretically possible to automate practically any industrial job. This midget could speed the shift.



ATOM: Convert Energy Directly

RCA's millionth-of-a-watt battery converts nuclear energy directly to electricity . . . Strontium 90 is energy source . . . Foresee 10 pct efficiency level . . . But much still to do.

Direct conversion of nuclear energy into electricity has long tantalized engineers and scientists. Last week Radio Corp. of America demonstrated a millionth-of-a-watt atomic battery that does the trick. But a lot of development work remains to be done.

Previously the only known way to convert nuclear energy was analagous to the conversion of chemical energy—by using heat of the reaction for a steam power plant. In this train the original energy is converted to heat, heat to mechanical, and mechanical to electrical in a generator. And power is lost at each step.

Room For Improvement

While the best efficiency so far obtained from the atomic battery is only about 1 pct, RCA states that an efficiency of 10 pct would not be an unreasonable goal. Since radioactive materials pack large amounts of energy into small volume, an extremely compact source of electricity is visualized.

Physically, the battery is quite simple. It consists of a thin layer of radioactive material on a semiconducting wafer with a transistor-like junction on the opposite side. In the demonstration model the radioactive material is strontium 90, a byproduct of reactor operation; the semi-conductor is germanium or silicon with an impurity alloyed in to form a junction.

High-energy electrons (beta rays) are emitted by the strontium isotope releasing 200,000 times as many slower electrons in the semiconductor. Result is a voltage potential between the junction and the wafer.

Approximately 0.00025 cu in. of strontium 90 supplied the beta rays for the demonstration. Junction area is about 0.05 sq in. This gave a 0.2-volt potential, providing a current of 5 micro-amperes—enough to energize a transistor and produce an audible tone in a telephone.

Expect Long Life

Although theoretically any radioactive material may be used, strontium 90 has several advantages: It emits high energy beta rays, no gamma particles if pure, and it has a relatively long life.

Beta radiation of a small battery raises no shielding problem. Shielding of the laboratory model is necessary because of the gamma rays of the impurities. Half-life of the strontium 90 is approximately 20 years. This isotope is also available in experimental quantities from the Atomic Energy Commission.

RCA foresees initial use, when the experiments have grown to the commercial stage, as a power source for small devices such as portable radios and hearing aids. A useful life of 20 years is envisioned.

Whether the principal can be applied to large power plants is not yet known. But it's a major step in using atomic energy.

ATOMIC battery power used by Brig. Gen. David Sarnoff tapping Morse message.

RADIOACTIVE material, coated on cylinder, bombards transistor-like wafer.

HOUSING: Major Economy Prop in '54

Administration program aimed at boosting building over last year's record $35 billion . . . Seen as vital to continued high durables demand . . . Ask more U. S. aid—By *A. K. Rannells.*

The vigorous housing program proposed by the White House is seen as the needed impetus which will help push 1954 construction activity above last year's record $35 billion. Housing activity is to be an increasingly important prop to the economy this year.

Continued high level in residential building is important to the construction industry. Such activity is now accounting for 28 pct of all construction expenditure—about $10 billion.

Boost Home Starts

It is especially important from the Eisenhower Administration viewpoint as a sustaining factor in demand for steel and steel products, heating and plumbing equipment, appliances, furnishings, hand tools, housewares, varied hardware and other items.

President Eisenhower has laid before Congress an 8-point housing program, placing the brunt of responsibility on private industry, yet providing government support and even outright aid.

Aim is to help boost new home starts in 1954 to a level of 1.25 million, or better. This would mean only an extra 150,000 units above last year.

Industry thinks it can be done. When government agencies added up 1953 figures, it was found that in spite of a bad start, 1953 barely missed being the second best homebuilding year on record.

More than 1.1 million new family units went into place, only 24,000 under the 1952 figure although considerably below the record 1.4 million units put up in 1950 before steel became tight.

Last year was the fifth in succession when home building topped the 1 million mark. Also, public housing dropped off by 39 pct to the lowest figure in 5 years—about 35,500 units, a level the Administration wants maintained.

Increase Mortgage Underwriting

Some presidential housing recommendations are not very palatable to Congress. But detailed legislative recommendations are being worked out between the White House and Senate-House committees. A White House spokesman says they can get together.

One significant Eisenhower proposal urges that the government broaden its mortgage underwriting and insure a greater percentage of individual mortgages on homes bought by low-income families. Idea is to step up trend toward lower priced houses.

Also, the White House proposes a new experiment. This would involve annual construction of 35,000 units of public housing for a period of 2 to 4 years, to be made available to lower income families throughout the country.

Up Loan Limit

Down payment would be as low perhaps as $200 and the term of the mortgage would run for 30 years or longer. Possibly there would be an arrangement by which a portion of initial rental payments could be set aside to apply on a down payment.

Most solid feature, and not likely to run into a great deal of congressional opposition, is the proposal to make credit easier for modernization and repair operations under Federal Housing Administration loans.

Specifically, the White House suggests that the present maximum loan limit be upped by $500 to a new ceiling of $3000. At the same time, the term could be as much as 5 years instead of the current limit of 3 years.

Plan Foreclosure Protection

Later last week, in his economic report to Congress, the President recommended that Federal Housing Administration be permitted to insure mortgages up to $20,000 instead of the current top of $16,000. He also revealed that the government is planning new safeguards for homeowners against foreclosure and loss of homes in the event of any serious economic depression in the future.

Modernization activity has been on the uptrend. Last year, expenditures for alterations and modernization rose 10 pct to a new total of $1.1 billion.

Replace Overage Homes

A survey made for the White House estimates that 19 million of the existing 37 million non-farm homes are 30 or more years of age and need a face-lifting.

Housing officials envision a doubling of present rates of such expenditures if credit for the purpose is eased.

Fabricated Structural Steel

Contracts, Shipments, Backlog

Estimated Net Tons

	1953	1952	Avg. 1947-50
CONTRACTS CLOSED			
December	204,227	236,264	207,912
Year's Total	2,786,591	2,503,521	2,370,040
SHIPMENTS			
December	266,926	225,161	199,379
Year's Total	3,117,711	2,664,255	2,256,536
BACKLOG	1,740,998	2,152,714	1,423,620

Source: American Institute of Steel Construction

Industry Studies Housekeeping Costs

Well attended meetings at the Maintenance Show heard pros and cons of cost control methods . . . Heated discussions covered incentives, time studies—*By K. W. Bennett.*

Long past the stage when a bucket and a wrench were the basic tools, maintenance has become more science than art, has become an industry that nets more business than some of the industries it serves.

Emphasizing the growing concern of management with keeping the wheels of industry turning as well and as cheaply as possible, almost 20,000 registrants showed up at the Fifth Plant Maintenance Show in Chicago last week. Exhibits were pored over, and conferences and technical sessions were well attended, lively and even heated on occasion.

"Over-rated, Uninspired, Misused"

At a packed conference session, budgets for plant maintenance brought verbal swordplay. "I have used budgets—some I made out myself and some were forced upon me—and I consider them over-rated, uninspired, and misused." The speaker, J. A. Openshaw, Stanley Home Products, Inc.

His solution: Know the manhours required for each maintenance job; base a cost control program on a check of the manhours used in each plant department served. Then make the maintenance department itself responsible for keeping cost at a minimum, production at maximum.

Budgets, it was pointed out, often set a maximum limit on costs but don't encourage cost reduction. A day-to-day manhour check in his 650-employee plant was proving a better costcutter.

What Goes Wrong

Whether a check is kept on manhours or budget dollars, accurate bookkeeping is the secret of cost reduction. Mr. T. J. Haselton, Monsanto Chemical Co., speaking on dollar budgets for maintenance departments, admitted that budgets can go astray and suggested four reasons:

(1) Inaccuracies in timekeeping;

(2) Lack of full background facts before a job is estimated;

(3) Lack of up-to-date knowledge of job costs;

(4) Inefficient use of manpower.

The budget user had eliminated these by careful weekly work scheduling of his craftsmen, weekly conferences with his engineer-supervisors, and daily cost reports for his engineers. Several speakers estimated 80 to 90 pct of maintenance work can be scheduled, leaving breakdowns as 10 to 20 pct of total time to be figured in scheduling maintenance work.

Argue on Standards

Like budgets and scheduling, work standards drew crossfire. To many maintenance men attending the conferences, measuring a man's output against a standard time for unscrewing a bolt was taking the human element out of work.

"If a man has had a tough night, how do you know what his standard performance should be at the shop the next day? After all, the guy is human." As another speaker pointed out, a man who's being timed on his job begins to feel he's working under a plant Gestapo.

Work standards advocates brought ammunition. Said W. C. Cooling, International Resistance Co., "You always get the 'rusty bolt' question when maintenance incentives are mentioned. 'How long does it take to remove a rusty bolt?' "

His answer: Set up a standard time for every phase of a maintenance operation, and take a long time, a lot of studies, to arrive at

HIGH ATTENDANCE is evident in this general view of Maintenance Show.

a standard time. Then set a standard time for the method used. If a man has to chip out a rusty bolt, pay him for chipping out a rusty bolt, not unscrewing a good bolt.

Pay the incentive wage that is based on these standards no less than every 2 weeks, to give time between pay periods for the worker to build up an average payment. Even so, you always leave a little leeway, for the jobs you can't devise an accurate time.

Keep Programs Simple

One rule of thumb from the conference: "Keep your cost control and scheduling programs simple." Don't use more than 1 cost control worker per 75 maintenance workers. If necessary, the supervisor must assume part of the cost control work.

More firms working up cost control programs are also working up work standards programs. The work standards advocates are gaining strength. And some of the most outspoken enemies of work standards in the past have crossed over, are ardent followers.

Incentive Pay Liked

George Meyers, maintenance specialist, suggested three basics in any cost control program. A complete and organized work-order system, accurate timekeeping on every job, and a tabulation of manhour costs on every work-order. While Mr. Meyers didn't say so, utilization of work standards fits well with figuring manhour costs, as other speakers emphasized. Manhours per job are a check on the work standards set up for that job—and work standards are a cross check on the number of manhours a worker expends on a particular job.

While a number of maintenance men liked incentive pay, they didn't like using work standards as a means of figuring incentives and said so. Incentive pay didn't seem to be running into union trouble, however, and it's been found that even a janitorial department can be put on an incentive pay based on measured work standards with increased work output from a similar work force as a result.

STEEL: Nonintegrated Mills Hurt

Semi-finished steel now plentiful but customers are hard to find . . . Some warehouses cut prices to unload inventory . . . Believe pickup is in the offing—By J. B. Delaney.

It's a familiar story for the nonintegrated steel producer, and not one to his liking. When times are good his production is limited by the amount of hot-rolled steel he can come by; when business is slow he can get all the hot-rolled he wants but not enough customers.

Today, he is flooded with offers of hot rolled steel, both from his regular suppliers and mills that formerly sold him little or nothing. But raw material is the least of his worries—it's lack of demand from his customers. Some nonintegrated mills have the largest inventories of raw material in their history.

One producer described his position this way:

"Business is lousy in the morning, but the rush falls off in the afternoon."

Some Cut Prices $5 Ton

It's not quite so bad as that, but a check of representative mills left little doubt that demand is off—anywhere from 10 to 25 pct from last year. No one is trying to hide his concern, although most of them feel their plight is little worse than that of the integrated mills, and better than some.

Perhaps the most irritating aspect of competition is that from warehouses long on inventory and short on money, some of whom are offering steel below mill prices—as much as $5 per ton off. This is costing the nonintegrated mills some business, although not as much as the inducement might indicate. The mills are not going out of their way to meet this type of competition. But most consumers are wary of such offers because they realize the situation is only temporary. Also, some have been stung on quality as a result of buying from irregular sources.

There may be some competition from integrated mills, but hardly enough to mention. One operator expressed his feeling this way: "If that's all we had to worry about, we wouldn't be worried." One reason for this is that the nonintegrated producer usually sells relatively small tonnages to individual customers, and part of this is in a so-called specialty category.

Apart from the price-cutting by certain warehouses, base prices of the nonintegrated mills are holding firm. Like the major mills, these producers have an eye cocked on next summer's labor negotiations which will affect their labor costs as well as those of the big mills.

They ask, logically enough, what advantage they would gain by cutting prices. They feel such a move would not sell any more steel, would only complicate their problem. Besides it would make more difficult the raising of prices should their labor costs go up later. Freight absorption, though, is common.

Virtually all producers have been forced to cut the work week and eliminate overtime pay. Where the 7-day week was common a year ago, mills today are working five, four, and even less today. Only good feature about this is that labor turnover is considerably reduced.

Still Expect Pickup

For some mills, current business is a hand-to-mouth proposition, a situation that probably is more worrisome than any other factor. Backlogs have virtually disappeared as consumers cut back on forward buying. One mill admitted that it had scarcely enough orders on hand this week to insure working through next week. Fortunately, enough business has been coming in to enable the mills to keep going, but there is no assurance this will keep on.

Despite the current recession, the mills are not completely soured on the outlook for 1954. Both the top brass and the sales force believe a pickup is in the offing.

IRON & STEEL: December Output By Districts

As Reported to the American Iron and Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Annual Capacity	PIG IRON Dec.	PIG IRON Year to Date	FERROMANG., SPIEGEL & SILVERY IRON Dec.	FERROMANG., SPIEGEL & SILVERY IRON Year to Date	TOTAL Dec.	TOTAL Year to Date	Pct of Capacity Dec.	Pct of Capacity Year to Date
Eastern	16,312,990	1,214,248	14,772,955	20,209	314,448	1,234,455	15,087,403	89.3	92.5
Pitts.-Yngstn.	28,643,120	1,957,046	26,856,709	37,486	424,279	1,994,532	27,280,988	82.1	95.2
Cleve.-Detroit	8,633,800	584,664	8,337,121			584,664	8,337,121	79.9	96.6
Chicago	16,251,250	1,220,345	15,598,685		23,686	1,220,345	15,622,371	88.6	96.1
Southern	6,020,380	446,785	5,554,960	8,207	92,625	454,992	5,647,585	89.2	93.8
Western	3,518,700	289,852	3,867,291			289,852	3,867,291	97.2	109.9
TOTAL	79,380,240	5,712,938	74,987,721	65,902	855,038	5,778,840	75,842,759	85.9	95.5

STEEL —NET TONS DISTRICTS	Annual Capacity	TOTAL STEEL* Dec.	TOTAL STEEL* Year to Date	Pct of Capacity Dec.	Pct of Capacity Year to Date	ALLOY STEEL Dec.	ALLOY STEEL Year to Date	HOT TOPPED CARBON INGOTS Dec.	HOT TOPPED CARBON INGOTS Year to Date
Eastern	23,863,810	1,663,446	22,599,009	82.2	94.7	79,881	1,696,616	235,225	4,290,219
Pitts.-Yngstn.	43,621,000	2,781,341	40,971,059	75.2	93.9	334,886	5,875,605	286,855	5,099,999
Cleve.-Detroit	12,002,909	734,372	11,142,193	72.2	92.8	45,131	876,791	50,234	950,902
Chicago	24,960,600	1,803,395	24,379,197	85.2	97.7	83,039	1,611,767	244,160	†3,685,083
Southern	6,036,160	499,343	5,840,481	97.6	96.8	2,223	51,462	8,500	70,287
Western	7,063,000	464,441	†6,677,780	77.6	94.5	8,731	126,104	18,821	306,155
TOTAL	117,547,470	7,946,328	†111,609,719	79.7	94.9	553,890	10,238,345	843,795	†14,402,645

* Includes Alloy Steel, Hot Topped Carbon Ingots. † Revised.
** Index of production based on average annual production of the years 1947, 1948 and 1949.

STEEL: Warehouse Prospects Perk Up

Brightening February outlook follows mid-January uptrend . . . Slim down inventory bulges . . . Most stocks ample, with some surpluses . . . Stress service—By K. W. Bennett.

Primary warehouse inventories are moving into a healthy position. After a buffeting by stormy and rapidly changing business weather in late 1953, warehousemen are reporting their stocks adjusted to a slower tempo.

First indication came when the number of cancellations of mill steel by warehousemen began to drop in the third week in December. With reports last week of a mild uptrend in warehouse sales volume, and with prospects for February brighter than January, remaining surplus stocks are shrinking.

Smooth Inventory Bulges

Most warehouses agree that November was a low point for 1953. Business had been excellent until late July. In August smaller warehouses were reporting stock beginning to pile up on the shelves, and by November some unbalanced warehouse inventories were beginning to bulge dangerously and in the wrong directions.

A pickup in the first 2 weeks of December partially corrected the situation, which had already been helped somewhat by warehouse cancellations of mill steel types in which the particular distributor was beginning to overload his bays. Currently, warehouse procurement of mill steel is running 20 to 50 pct below first half '53.

With stocks moving into balance, it's quite probable that an increase in warehouse business in February would be followed immediately by increased buying from supplier mills. At least one mill source indicates the average warehouse is buying about 10 pct less steel than it is selling over the counter to its own customers.

On cold-rolled sheet, for instance, stocks vary from excellent to "surplus", and the same is true for strip. There are some surpluses in alloy, 430 stainless needs considerable selling to clear old stocks, and nickel stainless is in plentiful supply.

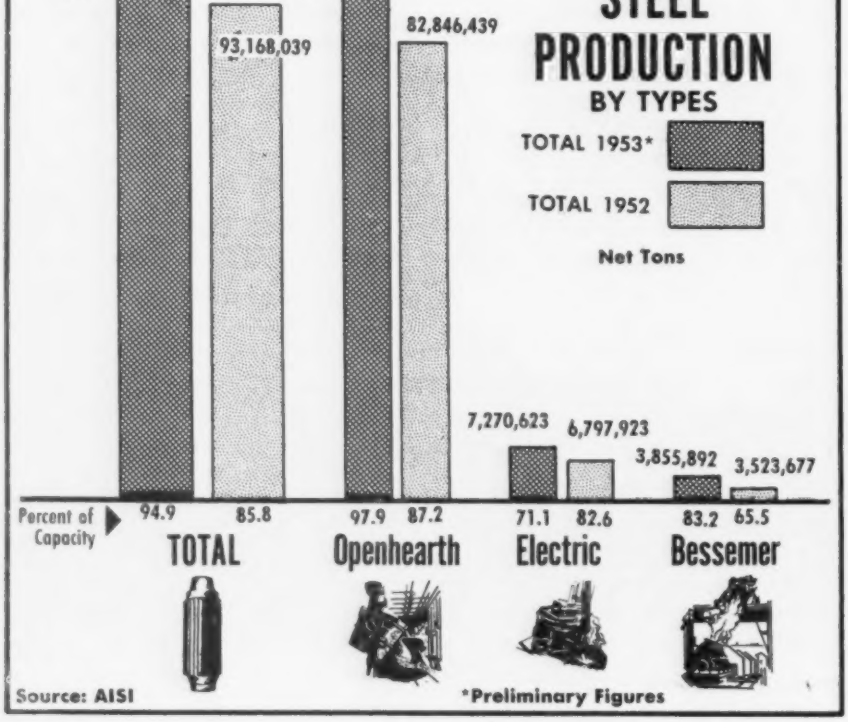
There are occasional reports of bar stock shortages in specific sizes, but generally both cold-finished and hot-rolled bar are in adequate amounts. Bar inventories, particularly in alloy, were among the first to swell following the mid-'53 slowdown.

Stocks Generally Good

With inventory correction continuing, climbing number of warehouses report a slight boost in January sales. January should beat December and February is counted on to continue the uptrend, though warehouse buying for their own inventories continues on a 30-day ordering basis. Coupled with short buying has been an increase in the volume of "pickups," one warehouse buying from another some item that a customer wants, and that the first warehouse doesn't have in stock.

Warehouse stocks are currently adequate or high, save in flat shapes, some types of structural, and a few special bar shapes. With sales inching up and surplus inventory bulges leveling out, the primary warehouses expect fairly good things from first quarter 1954. Estimates for the year continue at a cautious "10 pct less business in 1954 than in 1953." And a growing number of warehousemen talk of a final leveling off with 1953 anywhere from 15 to 25 pct ahead of 1954 in volume.

The percentages sound worse than they are. In 1952 warehouses did an estimated $1 billion business. In 1953, after winding up a cracking good first half, and despite a rapid drop in third quarter, it has been estimated that the same group will have marketed $1.1 billion. At best, warehouses could do at least as well as they did in 1952. At worst, on their own estimates, they would do $815,000,000 worth of business.



Cerro Bolivar:

How iron ore mountain is being moved to U. S.

There's a lot of iron ore in Cerro Bolivar, Venezuela. In fact, it's one of the greatest ore deposits in the world. To get at it U. S. Steel's subsidiary, Orinoco Mining Co., spent a lot of money (more than $170 million) and a lot of time (more than 6 years).

First shipment of ore from Cerro Bolivar arrived at U. S. Steel's Fairless Works 2 weeks ago after a journey of more than 2000 miles. It is expected that 3 million tons will be shipped during the remainder of the year and this will be upped to 5 million tons in 1955. Yield could amount to 10 million tons annually, if needed.

It's 4 Miles Long

A fleet of ore-laden steamships is now navigating the 154 mile Orinoco River which in the past 2 years has been dredged to a depth of 26 ft wherever necessary.

Truly a mountain of ore, the Cerro Bolivar deposit rises 1800 ft above the plains around it. Four miles long and 4000 ft wide, the ore body is 230 ft thick. Iron content is 62 to 69 pct.

CERRO BOLIVAR's iron ore mountain rises 1800 ft, is 4 miles long.

DRILLERS bore blast holes for dynamite (left) and then charge is set off to loosen the iron ore.

SHOVELS work the bench areas around the open mine. Three scoops to a truckfull.

AT PUERTO ORDAZ one of the world's fastest ship loaders capable of handling 6000 tons per hour is used to transfer ore from stockpile to ship.

SALESMEN: Lift

Ways to get more out of your salesmen spotlighted at market executives meeting.

How do you make salesmen sell? That was one of the problems tossed to a panel session at American Management Assn.'s marketing conference in New York last week.

Concentrating on methods of motivating salesmen so that they will not be content with a "well-enough is good-enough" attitude, Paul Larimer, general sales manager, Ansul Chemical Co., Marinette, Wis., hit several key factors that are important in motivating people:

Personal Recognition: Not solely praise, it is a form of communication which can transform a "plodding subordinate to an eager, enthusiastic subordinate."

Participation: "Dig down for the most effective manner in which to bring your personnel into discussions of your problems and objectives."

Compensation: If you don't pay a man enough to make him feel he's being treated fairly, you will offset anything else you may be doing to motivate him. Pay promptly.

Understanding: Most salesmen want help with their business problems, but many won't ask for it because they are afraid of admitting their ignorance. Motivation programs must include ways of making it possible for salesmen to discuss their problems frankly, without fear.

Product Respect: Salesmen must understand their product technically, its applications, and know how it fits into the economy.

Sell It—Don't Tell It

If you want to get a message across to your salesmen, you have to sell it, not tell it, advised C. W. Blount, vice-president, Bakelite Co., New York.

Mr. Blount told the marketing executives to know each man as an

Their Feet Off Desk

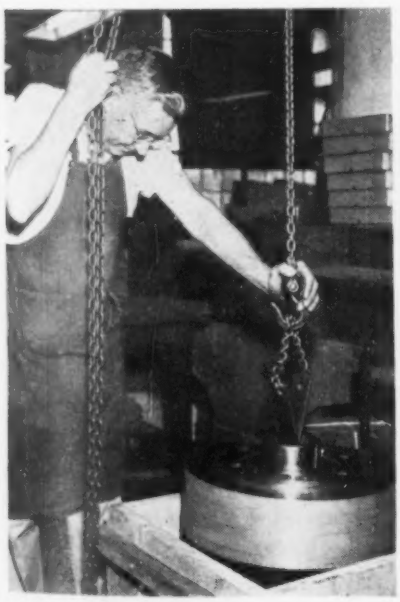
individual and that if there are too many to permit this, provide more supervisors. Bakelite has 17 supervisors for 101 salesmen, he said.

"When I Was Your Age"

In distributing information to men in the field make sure they receive it before they read it in the newspaper or hear it from customers, Mr. Blount warned. Talk and write in the present tense, avoid the line "Now when I was a salesman" or "When I was your age . . ."

Because modern selling depends so much on teamwork, the home office should not try to judge individual salesmen, Donald Couch, vice-president sales, American Radiator & Standard Sanitary Corp., Pittsburgh, told the marketing executives. Instead, headquarters should judge the whole district sales group while the district manager evaluates the individual salesmen under him.

In a separate talk, W. F. Allen, vice-president and director of sales, Upjohn Co., Kalamazoo, Mich., said careless selection of salesmen can be the most extravagant waste in total sales costs.



MOST COSTLY grinding wheel ever made by Norton Co., this $25,408 diamond wheel is crated for shipment to American Lava Corp., Chattanooga, Tenn. Wheel diam is 20 in., diamond depth 1/8 in.

Joining is easy with solvent cement . . .

Plastic Pipe:

Few tools needed for quick, low-cost installation.

Among its other virtues, plastic pipe is drastically simplifying pipelayers' tool kits. Practically the only tools needed to lay over a quarter of a mile of Tenite butyrate plastic pipe at Wilmington, N. C., recently, turned out to be a paintbrush and a carpenter's saw.

The pipeline will be used to carry corrosive well water to decarbonizing tanks at Carolina Power & Lighting Co.'s new steam electric generating plant. The water is air saturated and contains a high percentage of CO_2.

Extruded of Tenite butyrate plastic, the corrosion-resistant pipe has an inside diameter of 3 in. Ends of the 20-ft lengths were painted with solvent cement, pushed into slip-sleeve couplings to provide, in effect, welded joints. Final length was cut to fit with an ordinary carpenter's saw.

Speed of joining, plus ease of handling due to light weight cut installation time to half that for metal pipe. Material costs were about half those for red brass pipe.

Buried 3 in. below ground, the plastic line will operate at about 50 psi. Pipe was satisfactorily tested up to 70 psi before burying.

Installation was made under the supervision of Ebasco Services, Inc., New York. Grinnell Corp., Warren, Ohio, supplied the pipe, which was extruded by Busada Manufacturing Co., Maspeth, N. Y. Tenite butyrate plastic is marketed by Eastman Chemical Products, Inc., Kingsport, Tenn.

. . . One man can move it . . .

. . . and you can cut it with a handsaw.

Enamel:

Plan commercial output of porcelain enameled aluminum.

Possibility of large-scale commercial production of porcelain enameled aluminum looms nearer with completion of capacity expansion at Ingram Richardson Mfg. Co., Beaver Falls, Pa. Company says it is now able to turn out up to 250,000 sq ft of porcelain enameled aluminum per month.

Main use is expected to be as an architectural material, although other applications are also anticipated. More costly than enameled steel, porcelain enameled aluminum is said to be easier to fabricate on the job and can be sheared or drilled with a minimum of shattering.

Need Closer Control

J. F. Ingram, Ing-Rich president, says production of porcelain enameled aluminum requires more critical control in the manufacturing process than does porcelain enameled steel. To make production of the new material possible, changes had to be made in some of the company's furnaces, frit grinding equipment, other units.

Porcelain enameled steel is fused at furnace temperatures of 1500° to 1600° F. Same process for aluminum is carried out at temperatures ranging from 980° F to 1000° F. However, temperatures throughout the entire furnace must be controlled to very close limits, with a tolerance of only ±5° F.

Ing-Rich now has three types of furnaces ready for the production of porcelain enameled aluminum—a continuous type, a box type, and a continuous-intermittent type.

ECONOMY: Ike Sees No Cause to Worry

President's economic message views business decline as temporary, ending . . . But Administration ready to help if trouble looms . . . Unemployment not serious—By *A. K. Rannells.*

Current economic declines are just about over and will shortly have leveled off, if President Eisenhower has correctly interpreted the signs indicated by surveys of his advisers.

Recent economic fluctuations are definitely not considered cause for alarm. Instead, they are felt to have resulted from an industrial awareness that adjustments were essential, due to a slowdown and stretching out of defense spending.

The Chief Executive makes it clear that while his Administration won't be stampeded at the first cry of wolf, it nevertheless stands ready to use any and all of its "arsenal of stabilizing weapons" wrapped up in various programs.

Excess inventories have been worked off to realistic levels, in the view of the White House. This has been reflected back at factory level where production is being adjusted to meet changing requirements.

This shuffling is just about over, it is further believed, and a slow but healthy increase in business activity is "likely to be resumed this year," especially if Congress goes along with the Administration program. The White House economic report shows:

ECONOMIC STATUS

Production—Rose to an all-time high of $367 billion for 1953. Measured in terms of 1939 dollars, it would have been $179 billion, still an all-time high.

Personal Income—Added up to $285 billion for 1953, out of which $18 billion went into savings and $37 billion to the tax collector. This means actual spending of $231 billion.

Employment—There were 60.8 million workers on the job at end of 1953, a decline of 700,000 during the year. However, unemployment rose only 440,000 for the period to 1.8 million.

Wages and Hours — Workweek declined in manufacturing by 1.6 hours to an average 40.1, reflecting a cutting out of overtime. But hourly average wage rose 6¢ to $1.79.

ROLE OF BUSINESS

President Eisenhower believes responsibility for deflecting a depression or even a recession lies primarily with industry and business, that only a minimum of government aid should be required as a stabilizing factor.

The White House doesn't view with alarm the present labor dislocations now taking place, although employment decline in late 1953 was more than seasonal.

Reason is that while unemployment is now higher than a year previous, it is significant that the decline in employment was nearly twice the increase in unemployment — indicating that many of those dropped have retired or otherwise quit the labor force.

Savings rate of consumers over past 3 years has been better than 7 pct of income—3 pct higher than for the 1947-50 period.

Thinking of the President and his advisers is that this represents high level buying power — that businessmen and merchants "who push new or improved products, who produce established goods at lower costs, or who practice more aggressive salesmanship will find their markets expansible."

NORMAL PROGRAM

President Eisenhower believes that enactment of a substantial portion of his legislative program should prevent recession.

This calls for selective tax relief for both business and individuals through revisions which, it is estimated, would provide tax savings amounting to $1.2 billion in addition to those already in effect.

It calls, too, for broadened social security coverage and increased benefits, liberalized housing credit as a spur to building, and continuation of the present public works program at a slightly higher level than the present $1.8 billion.

EMERGENCY PROGRAM

These measures, the White House believes, should be sufficient prop for additional "expansion of private activity, stimulate consumers to spend more money, create more jobs. . . ."

If these should look to be inadequate for offsetting any serious downtrends, the Administration would then promptly invoke the emergency "weapons."

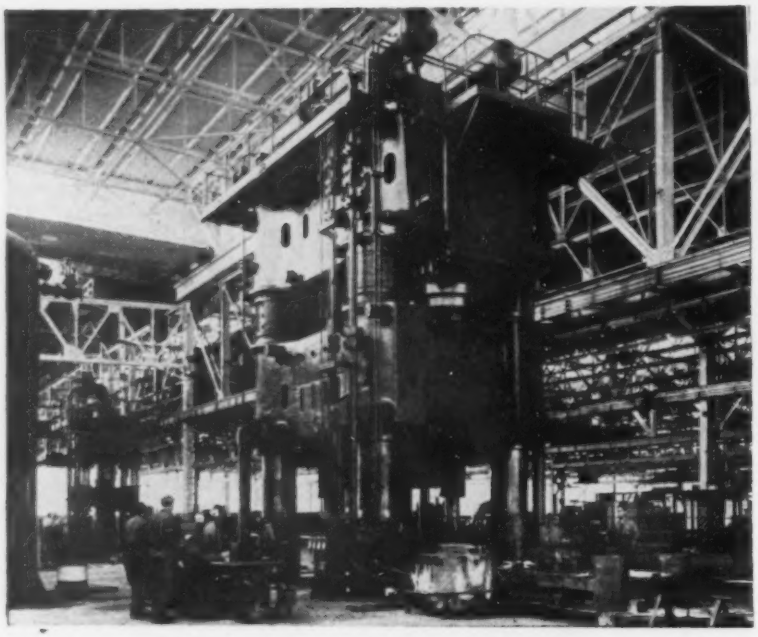
They are frankly stated in a broad sense, however, as "greater use of monetary debt management and credit policy, expansion on a large scale of the construction of public works (additional), modification of the tax structure, liberalized use of federal insurance of private obligations."

Delay Wage Revisions

Recommendations for revision of minimum wage law have been temporarily delayed at White House level. President Eisenhower is fully aware of the danger to those intended to be helped, by, in effect, the possibility of "raising their cost of living and reducing their chances of employment."

In spite of labor pressure, the Administration won't be hurried. Many low-pay industries, the President points out, make only modest profits and could "easily be squeezed out of business."

Latest talk is that when the White House does make its proposals "at the proper time," they may be double-barreled—(A) to raise the minimum for businesses now covered to 90¢ and (B) to extend coverage to other fields but to set a lesser minimum for them, particularly for small business, of perhaps 75¢ an hour.



Study Heavy Press Use for Titanium

Operation of the U. S. Air Force heavy aluminum press and extrusion plant at Adrian, Mich., will be taken over Feb. 15 by the Aluminum Div. of Bridgeport Brass Co.

This company entered the aluminum field in 1951 and signed a long-term lease Dec. 22, 1953 under which it will make extrusions and forgings for the Air Force. At the same time, it will develop its own commercial program including titanium which the company hopes will lead to permanent operations at the plant.

Herman W. Steinkraus, president of Bridgeport Brass, has stated that development of titanium processing and production will be a big part of the research and development program at the plant.

"The equipment at Adrian is also suitable for working titanium and other metals which we plan to undertake, since the growing demand for these metals in aircraft production is well known," he pointed out.

The plant has been operated for the Air Force by other companies, principally for experimental work, and also stood idle for another period. Its equipment includes a battery of 16 extrusion presses, one a 5500-ton press, as well as heavy forging presses.

Largest unit is a 17,500-ton forging press standing 88 ft high. It is one of the three largest standing in the country now, although bigger ones are under construction. It was one of the heavy presses received from Germany under the repatriation program at the close of World War II. Installation cost was about $750,000, but it would probably cost $5 million to construct today.

Under the terms of the lease, Bridgeport will pay a rent based on production. It will also pay rent to the Air Force for commercial work done on the plant equipment in addition to defense requirements.

Photo above shows a 17,500-ton forging press, one of the three largest of its kind in operation in the U. S. today. Press is part of the facilities at the Adrian plant.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

AF spares stock, V, $80,388, Beech Aircraft Corp., Wichita, Kansas.

Safag cutter grinders, 45, $120,272, Carl Hirschmann Co., Inc., Manhasset, N. Y.

Projectile, TP, 20 MM, 1447500, $252,588, Anderson Brass Works, Birmingham, Alabama.

Turbo-jet engines, 2, $441,984, United Aircraft Corp., Pratt & Whitney Div. East Hartford, Conn., *E. E. Champion.*

Special tools and ground handling equipment, $300,000, United Aircraft, Pratt & Whitney Div., East Hartford, Conn., *E. E. Champion.*

Replenishment of tools, 122, $187,478, Manbee Equipment Div., Chicago, Ill.

Spare parts for fire control program, N/A $126,569, Control Instrument Co., Inc., Brooklyn, N. Y.

Classified fuze plus installation of electric detonators, Job, $43,853, Rodorn Mfg. Corp., N. Y.

Actuator cap assy, Var, $74,577, Air Associates, Inc., Teterboro, N. J.

Propeller governor test stand, Var, $76,030, Greer Hydraulics, Inc., Brooklyn, N.Y.

Maintenance parts and assys used on power, Var, $947,482, Airesearch Mfg. Co., Los Angeles, Calif.

Spare parts for P&W engines, Var, $230,375, United Aircraft Corp., Pratt & Whitney Div., East Hartford, Conn., *E. E. Champion.*

Control for use on J57P7 engines, 14 ea, $89,956, United Aircraft Corp., Pratt & Whitney Div., East Hartford, Conn., *E. E. Champion.*

Spare parts for use on P&W engines, Var, $651,646, United Aircraft Corp., Pratt & Whitney Div., East Hartford, Conn., *E. E. Champion.*

Assemblies for use on HSD propellers, Var, $73,856, United Aircraft Corp., Windsor Locks, Conn.

Spare parts for 0-435-17 engines, $126,150, Lycoming Spencer Div., Avco Mfg. Corp., Williamsport, Pa.

Turn & slip indicators spare parts and data, 1563 ea, $124,536, R. C. Allen Business Machines, Inc., Grand Rapids, Mich.

Airplanes, 40 ea, $171,560, Piper Aircraft Corp., Lock Haven, Pa.

Generator, aircraft, 874 ea, $450,519, General Electric Co., Schenectady, N. Y.

Altitude controls & mountings, 340 ea, $3,218,140, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., *S. F. Keating.*

Tank spare parts, 300 ea, $88,266, Clyde Engineering & Manufacturing Corp., Royal Oak, Mich.

Clocks, aircraft, 2706, $65,106, Waltham, Watch Co., Waltham, Mass.

Clocks, elapsed time, 2258, $118,410, Elgin National Watch Co., Elgin, Illinois.

Cups, cartridge, brass, 412450, $180,653, Plume & Attwood Mfg. Co., Thomaston, Conn.

Spare parts for mount M79, 106 MM recoilless rifle, 30, $572,558, The Oliver Corp., York, Pa.

Telescope mounts and spare parts, $838,955, Northrup Aircraft, Inc., Anaheim, Calif.

Pump, hydraulic, 20, $166,013, Vickers, Incorporated, Detroit, Michigan.

Fuze, 900000, $748,800, The Schaible Company, Cincinnati, Ohio.

Fuze, 894000, $768,840, The Schaible Company, Cincinnati, Ohio.

Whell, HE M49A2, PTS 60 MM mortar, 1245000, $1,703,750, U. S. Machine Div., Lebanon, Indiana.

Machine-dishwashing for troop scullery, 30, $86,469, Food Service, Products, Los Angeles, Calif.

Propulsion turbine unit, 4, $583,700, General Electric Co., Washington, D. C.

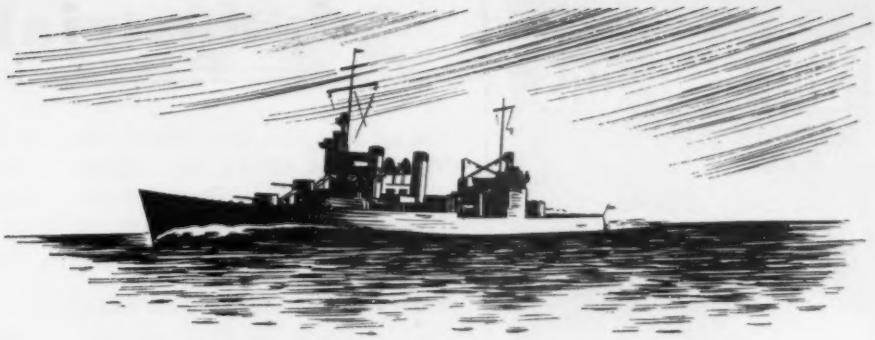
Bull gear and shaft, 1, $60,060, Westinghouse Electric Corp., Washington, D. C.

Rotary plug valve, 587, $83,748, Atwood & Morrill Co., Salem, Mass.

Filter gasoline, 270, $253,248, Bendix-Skinner Div., of Bendix Aviation Corp., Royal Oak, Michigan.

Tensimoter non-magnetic, 2120, $337,364, John Chatillon and Sons, N. Y.

Ground handling equipment, Var, $248,900, McDonnell Aircraft Corp., St. Louis.



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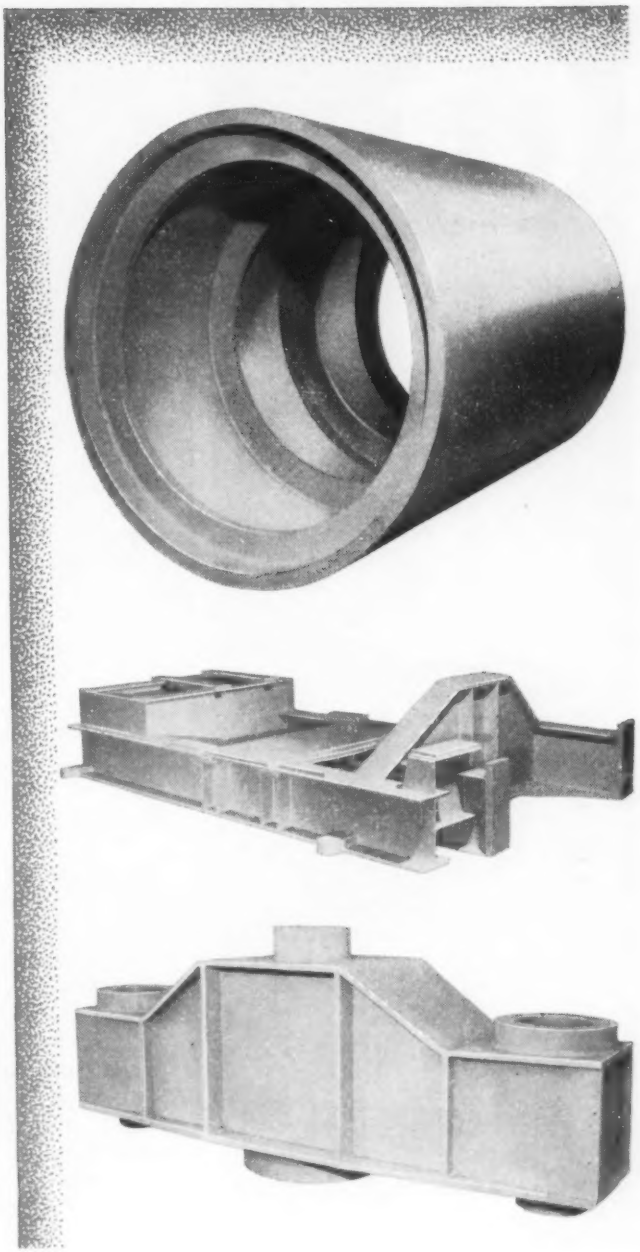

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Industrial Briefs

Elected Prexy . . . INSTITUTE OF SCRAP IRON & STEEL, INC., elected David C. Holub, Holub Iron & Steel, Inc., president at its annual convention recently.

New Moniker . . . ROCKWELL MFG. CO. reports that its air-powered hydraulic drill units will now be marketed under the "Rockwell" trademark. They were previously marketed under the "Delta-Milwaukee" trademark.

Congrats . . . REVERE COPPER & BRASS, INC., celebrated production of the one millionth 90 mm steel cartridge case at its Clinton Mfg. Div. The shell case was presented to Colonel E. G. Miller of Rochester Ordnance District.

Exclusive License . . . NORTHROP AIRCRAFT, INC., awarded the E. H. Stau Co., Los Angeles, an exclusive license to manufacture and market a Northrop-developed cable slack compensator.

New Home . . . CALUMET & HECLA, INC., has moved the sales offices for the Wolverine Tube Div. to Room 207, Larson Bldg., 25 South Bemiston Ave. T. F. Vigmostad is the sales representative there.

Opens Office . . . DIAMOND MACHINE TOOL CO., Pico, Calif., has opened a new office in San Francisco at 420 Market St., with Henry Dansereau as district manager.

They Approve . . . Shareholders of American Metal Products Co., Detroit, and Tube Reducing Corp., Wallington, N. J., overwhelmingly approved merger of the two companies. Tube Reducing will operate as a wholly-owned subsidiary.

Engineering Center . . . CLEVELAND ENGINEERING SOCIETY announced that a $1,378,000 building and development program is planned for construction of a new downtown engineering center.

Opportunity Knocks . . . GENERAL MOTORS INSTITUTE has made available a booklet, *Appointment to Opportunity*, for young men interested in continuing their education after high school in the fields of engineering and business administration.

Appoints Rep. . . . KEWANEE-ROSS CORP., Kewanee, Ill., has appointed the Debco Equipment Co., Inc., as its representative in the St. Louis territory.

Named Distributor . . . THE BERYLLIUM CORP., Reading, Pa., has appointed the Albert W. Pendergast Safety Equipment Co. its Philadelphia regional distributor for Beryl-co non-sparking safety tools.

IFMA Elects . . . L. H. Gillette, Westinghouse Electric Corp. has been elected president of INDUSTRIAL FURNACE MANUFACTURERS ASSN. Horace Drever, Drever Co., is new vice-president, and R. E. Whittaker, Swindell-Dressler Corp., treasurer. N. H. Davies, North American Mfg. Co., was named to the board of directors.

Honored . . . PHILADELPHIA ENGINEERS CLUB presented Eugene J. Houdry the historic John Scott Medal Award. The Scott Award was created by a Scottish chemist in 1816 "for ingenious men and women who make useful inventions." Mr. Houndry received it in recognition of his achievements in the catalytic cracking of petroleum.

Formed . . . LINDBERG ENGINEERING CO., Chicago, has formed Efco-Lindberg Ltd., with headquarters at 544 Inspector St., Montreal. F. W. Wilson is president and A. W. Smith will be manager.

Coming Up . . . The 1954 PITTSBURGH CONFERENCE on Analytical Chemistry and Applied Spectroscopy will be held Mar. 1-5, at the Hotel William Penn, Pittsburgh.

Open House . . . GENERAL ELECTRIC CO. held an open house last week formally opening its new $1.6 million Apparatus Service Shop and Warehouse in Philadelphia.

New Drive . . . JESSOP STEEL CO., Washington, Pa., has acquired the former Jessop Steel Sales Co., an independently-owned warehousing organization which had the sales franchise for Jessop Steel products in Michigan. The company will operate as a division under the direction of John R. Harbaugh.

Official Steel Ingot Capacities By IRON AGE Districts

Source: American Iron and Steel Institute

Ingot Capacity by Districts

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1954	1953	1952	1951	1948
Chicago					
American Locomotive Co.	78,000	78,000	78,000	78,000	78,000
American Steel & Wire Div.	973,000	918,000	918,000	918,000	690,000
Borg-Warner Corp.	64,000	64,000	30,000	28,350	24,000
Columbia Tool Steel Co.	6,600	6,600	6,600	6,600	6,600
Continental Steel Corp.	394,000	394,000	394,000	393,760	364,000
A. Finkle & Sons	36,600	32,000	.....	.....	.....
Inland Steel Co.	4,700,000	4,500,000	3,750,000	3,750,000	3,400,000
International Harvester Co.	1,000,000	1,000,000	900,000	900,000	900,000
Joslyn Mfg. & Supply Co.	37,500	37,500	37,500	37,500	37,500
Northwestern Steel & Wire Co.	825,000	825,000	321,000	321,000	321,000
Reconstruction Finance Corp.					
East Chicago	.....	.....	.....	.....	120,000
Republic Steel Corp.	1,232,000	1,232,000	1,132,000	1,100,000	1,225,000
United States Steel Co.					
Gary	7,117,000	6,593,000	6,264,400	6,025,700	5,718,800
South Works	5,470,000	5,016,000	4,891,000	4,675,000	4,525,000
Total	12,587,000	11,609,000	11,155,400	10,700,700	10,243,800
Youngstown Sheet & Tube Co.	2,656,000	2,103,500	1,526,000	1,526,000	1,446,000
TOTAL Chicago District	24,586,700	22,800,600	20,248,500	19,759,910	18,855,900
Pittsburgh					
Allegheny Ludlum Steel Corp.	746,700	746,700	746,700	766,860	430,860
American Locomotive Co.	103,000	103,000	103,000	103,000	103,000
American Steel & Wire Div.	1,015,000	900,000	900,000	900,000	842,000
Armco Steel Corp.	498,000	474,000	474,000	474,000	432,000
Babcock & Wilcox Tube Co.	229,450	229,450	193,450	64,800	50,400
Bethlehem Steel Co.	2,280,000	2,100,000	2,100,000	2,028,000	1,900,000
Braeburn Alloy Steel Corp.	20,730	20,730	20,730	20,730	20,730
Byers, A. M. Co.	75,000	75,000	75,000	75,000	150,000
Colonial Steel Co.	30,000	29,820	7,020	7,020	7,020
Crucible Steel Co.					
Midland	1,284,000	1,284,000	1,137,000	1,095,000	997,950
Park	.....	.....	.....	.....	183,100
Total	1,284,000	1,284,000	1,137,000	1,095,000	1,181,050
Edgewater Steel Co.	89,890	89,890	89,890	146,470	140,170
Firth Sterling, Inc.	20,040	20,040	20,040	20,040	20,040
Heppenstall Steel Co.	55,550	55,550	55,550	42,880	46,580
Jessop Steel Co.	33,490	33,490	33,490	41,560	50,000
Jones & Laughlin Steel Corp.					
Aliquippa	1,764,000	1,764,000	1,764,000	1,764,000	1,764,000
Pittsburgh	3,097,500	3,337,500	2,580,000	2,137,500	2,137,500
Total	4,861,500	5,101,500	4,344,000	3,901,500	3,901,500
Latrobe Steel Co.	24,000	24,000	25,200	12,000	12,000
Mesta Machine Co.	105,000	105,000	105,000	105,000	105,000
National Tube Div.	1,446,000	1,224,000	1,224,000	1,164,000	1,164,000
Pittsburgh Steel Co.	1,404,000	1,320,000	1,072,000	1,072,000	1,072,000
Union Electric Steel Corp.	27,760	26,760	26,760	26,760	21,000
Universal-Cyclops Steel Co.	70,160	70,160	70,160	54,120	54,120
United States Steel Co.					
Clairton	1,064,000	947,000	900,000	870,000	805,000
Duquesne	1,462,000	1,735,000	2,060,000	1,942,800	1,742,800
Edgar Thompson	2,179,000	2,090,000	2,080,400	2,080,400	1,753,000
Homestead	3,570,000	4,406,000	4,366,000	4,866,000	4,279,000
Johnstown	25,000	25,000	24,400	24,400	24,400
Vandergrift	275,000	275,000	550,000	480,000	500,000
Total	8,575,000	9,478,000	9,980,800	10,263,600	9,104,200
Vanadium-Alloys Steel Co.	11,910	11,910	11,910	11,910	11,910
Vulcan Crucible Co.	9,600	9,600	9,600	9,600	9,600
TOTAL Pittsburgh District	23,015,780	23,532,600	22,765,300	22,405,850	20,828,180

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1954	1953	1952	1951	1948
Philadelphia					
Alan Wood Steel Co.	625,000	625,000	625,000	550,000	550,000
Armco Steel Corp. (Rustless Iron & Steel Div.)	102,000	102,000	102,000	102,000	95,000
Baldwin-Lima-Hamilton Corp.	169,960	169,960	169,960	149,300	149,300
Bethlehem Steel Co.					
Bethlehem	3,214,000	3,148,000	3,128,000	3,080,000	2,585,000
Sparrows Point	5,750,000	5,400,000	5,400,000	5,160,000	4,651,000
Steelton	1,356,000	1,312,000	1,312,000	1,032,000	886,000
Total	10,320,000	9,860,000	9,840,000	9,272,000	8,122,000
Carpenter Steel Co.	85,800	85,800	85,800	81,360	74,880
Central Iron & Steel Co.	406,000	406,000	406,000	406,000	288,000
Claymont Steel Corp. (C.F.&I.)	494,570	494,570	468,000	468,000	460,000
Henry Disston & Sons, Inc.	25,000	25,000	25,000	25,000	25,000
Eastern Stainless Steel Co.	32,000	32,000	14,400	12,000	.....
Harrisburg Steel Corp.	100,750	100,750	100,750	100,750	100,750
Lukens Steel Co.	750,000	675,000	675,000	675,000	624,000
Midvale Co.	353,370	324,950	274,650	417,370	523,770
Milton Steel Products Div. (Merritt-Chapman-Scott)	43,000	53,700	53,700	50,760	.....
Newport News Shipbuilding & Drydock Co.	12,000	12,000	12,000	12,000	7,500
Phoenix Iron & Steel Co.	432,000	432,000	432,000	431,430	231,400
J.A.Roebling'sSonsCo.(C.F.&I.)	235,000	236,000	204,870	204,870	253,000
United States Steel Co.	2,200,000	1,200,000	.....	.....	.....
TOTAL Philadelphia District	16,386,450	14,833,730	13,489,130	12,957,940	11,504,600
Valley (Youngstown)					
Copperweld Steel Co.	618,380	618,380	618,380	554,400	450,000
Damascus Tube Co.	1,800	1,800	1,800	1,800	.....
Empire Steel Co.	455,000	455,000	409,300	390,320	369,730
Industrial Forge & Steel, Inc.	48,600	48,600	48,600	48,600	50,000
Reconstruction Finance Corp.	.....	.....	.....	360,000*	360,000*
Republic Steel Corp.					
Canton	1,125,000	1,125,000	1,125,000	975,000	775,000
Massillon	620,000	620,000	620,000	610,000	610,000
Warren	900,000	900,000	900,000	900,000	860,000
Youngstown	2,142,000	2,142,000	2,142,000	2,130,000	2,150,000
Total	4,787,000	4,787,000	4,787,000	4,615,000	3,395,000
Sharon Steel Co.					
Farrell	1,000,000	1,000,000	1,000,000	981,400	1,000,000
Lowellville	550,000	550,000	550,000	460,000	572,000
Total	1,550,000	1,550,000	1,550,000	1,441,400	1,572,000
Timken Roller Bearing Co.	648,000	625,200	547,200	547,200	547,200
United States Steel Co.					
Youngstown	2,943,000	2,734,000	2,684,000	2,484,000	2,344,000
Youngstown Sheet & Tube Co.					
Brier Hill	1,182,000	1,182,000	1,182,000	1,182,000	1,104,000
Campbell	1,662,000	1,662,000	1,662,000	1,542,000	1,452,000
Total	2,844,000	2,844,000	2,844,000	2,724,000	2,556,000
TOTAL Valley District	13,895,780	13,663,980	13,490,280	13,166,720	12,643,93

* Idle capacity formerly reported with Republic at Canton.

DISTRICT—COMPANY	Rated Annual Capacity—Net Tons				
	1954	1953	1952	1951	1948
Western					
Bethlehem Pacific Coast Steel Co.					
Los Angeles	402,000	402,000	384,000	324,000	213,000
San Francisco	252,000	252,000	240,000	240,000	235,000
Seattle	246,000	246,000	216,000	216,000	210,000
Total	900,000	900,000	840,000	780,000	658,000
Cabot Shops, Inc.	550,000	.....	.....	.....	.....
Cameron Iron Works	58,800	58,800	.....	.....	.....
Colorado Fuel & Iron Corp.	1,485,000	1,485,000	1,320,000	1,320,000	1,272,000
Columbia-Geneva Steel Div.					
Geneva	1,879,000	1,675,000	1,600,000	1,440,000	1,283,400
Pittsburg	391,000	397,000	364,700	364,700	362,600
Torrance	224,000	214,000	213,700	213,700	208,200
Total	2,494,000	2,286,000	2,178,400	2,018,400	1,854,200
General Services Adm.	.....	72,300	72,300	.....	.....
Hoster Steel Corp.	16,920	16,920	16,920	.....	.....
Isaacson Iron Works	102,000	102,000	102,000	101,520	104,400
Judson Steel Co.	76,500	76,500	76,500	76,500	76,500
Kaiser Steel Corp.	1,536,000	1,536,000	1,380,000	1,200,000	870,000
R. G. Le Tourneau, Inc.	83,100	138,600	.....	.....	.....
Lone Star Steel Co.	550,000	.....	.....	.....	.....
National Supply Co.	50,200	50,200	63,000	50,400	41,400
Northwest Steel Rolling Mills	42,000	42,000	32,400	32,400	32,400
Oregon Steel Mills	110,000	110,000	110,000	110,000	66,100
Pacific States Steel Corp.	181,770	298,000	232,000	231,300	94,500
Seidelhuber Steel Rolling Mill Co.	.....	60,000	49,300	.....	.....
Sheffield Steel Corp. (Armco)					
Sands Springs	54,000	54,000	54,000	54,000	54,000
Houston	1,050,000	1,050,000	1,050,000	840,000	560,000
Total	1,104,000	1,104,000	1,104,000	894,000	614,000
Southwest Steel Rolling Mills	45,000	45,000	36,000	36,000	.....
Texas Steel Corp.	36,000	22,320	22,320	22,320	22,320
TOTAL Western District	8,883,290	8,403,640	7,635,140	6,872,840	5,705,820
Detroit					
Allegheny Ludlum Steel Corp.	3,000	3,000	3,000	3,000	3,000
Ford Motor Co.	1,755,000	1,648,200	1,521,280	1,471,940	1,115,100
Great Lakes Steel Corp.	3,400,000	3,150,000	2,600,000	2,450,000	2,100,800
McLouth Steel Corp.	967,780	579,700	581,100	420,000	.....
Rotary Electric Steel Corp.	425,000	425,000	425,000	425,000	255,000
TOTAL Detroit District	6,550,780	5,805,900	5,130,380	4,769,940	3,473,100
Buffalo					
Allegheny Ludlum Steel Co.					
Dunkirk	33,000	33,000	33,000	33,000	33,000
Tonawanda	4,500	4,500	4,500	4,500	4,500
Total	37,500	37,500	37,500	37,500	37,500
Bethlehem Steel Corp.	5,000,000	4,740,000	4,020,000	3,920,000	3,120,000
Erie Forge Co.	234,000	234,000	234,000	85,000	80,000
Erie Forge & Steel Co.	.....	.....	.....	.....	128,950
National Forge & Ordnance Co.	25,000	25,000	25,000	25,000	25,000
Republic Steel Corp.	882,000	882,000	882,000	870,000	830,000
Simonds Saw & Steel Co.	21,600	21,600	21,600	21,600	21,600
Colorado Fuel & Iron Corp.	252,000	252,000	240,000	240,000	180,000
TOTAL Buffalo District	6,452,100	6,192,100	5,460,100	5,199,100	4,423,050
Cleveland					
Jones & Laughlin Steel Corp.	1,305,000	1,305,000	1,155,000	945,000	840,000
National Tube Div.	2,364,000	2,320,000	2,300,000	2,250,000	1,884,000
Republic Steel Corp.	2,572,000	2,572,000	1,900,000	1,637,000	1,500,000
TOTAL Cleveland District	6,241,000	6,197,000	5,355,000	4,832,000	4,224,000

By IRON AGE Districts

eel Institute

STRICT COMPANY	Rated Annual Capacity—Net Tons				
	1954	1953	1952	1951	1948
tern					
lehem Pacific Coast Steel Co.					
s Angeles	402,000	402,000	384,000	324,000	213,000
n Francisco	252,000	252,000	240,000	240,000	235,000
attle	246,000	246,000	216,000	216,000	210,000
Total	900,000	900,000	840,000	780,000	658,000
t Shops, Inc.	550,000				
eron Iron Works	58,800	58,800			
rado Fuel & Iron Corp.	1,485,000	1,485,000	1,320,000	1,320,000	1,272,000
mbia-Geneva Steel Div.					
neva	1,879,000	1,675,000	1,600,000	1,440,000	1,283,400
ttsburg	391,000	397,000	364,700	364,700	362,600
rrance	224,000	214,000	213,700	213,700	208,200
Total	2,494,000	2,286,000	2,178,400	2,018,400	1,854,200
eral Services Adm.		72,300	72,300		
ler Steel Corp.	16,920	16,920	16,920		
cson Iron Works	102,000	102,000	102,000	101,520	104,400
son Steel Co.	76,500	76,500	76,500	76,500	76,500
ler Steel Corp.	1,536,800	1,536,000	1,380,000	1,200 000	870,000
I. Le Tourneau, Inc.	83 100	138,800			
e Star Steel Co.	550,000				
ional Supply Co.	50,200	50,200	63,000	50,400	41,400
thwest Steel Rolling Mills	42,000	42,000	32,400	32,400	32,400
gon Steel Mills	110,000	110,000	110,000	110,000	66,100
ific States Steel Corp.	161,770	298,000	232,000	231,300	94 500
felhuber Steel Rolling Mill Co.		60,000	49,300		
ffield Steel Corp. (Armco)					
anda Springs	54,000	54,000	54,000	54,000	54,000
louston	1,050,000	1,050,000	1,050,000	840,000	560,000
Total	1,104,000	1,104,000	1,104,000	894,000	614,000
thwest Steel Rolling Mills	45,000	45,000	36,000	36,000	
an Steel Corp.	36,000	22,320	22,320	22,320	22,320
TOTAL Western District	8,883,290	8,403,640	7,635,140	6,872,840	5,705,820
troit					
egheny Ludlum Steel Corp.	3,000	3,000	3,000	3,000	3,000
d Motor Co.	1,755,000	1,648,200	1,521,280	1,471,940	1,115,100
eat Lakes Steel Corp.	3,400,000	3,150,000	2,600,000	2,450,000	2,100,800
Louth Steel Corp.	967,780	579,700	581,100	420,000	
tary Electric Steel Corp.	425,000	425,000	425,000	425,000	255,000
TOTAL Detroit District	6,550,780	5,805,900	5,130,380	4,769,940	3,473,100
falo					
egheny Ludlum Steel Co.					
Dunkirk	33,000	33,000	33,000	33,000	33,000
Tonawanda	4,500	4,500	4,500	4,500	4,500
Total	37,500	37,500	37,500	37,500	37,500
thlehem Steel Corp.	5,000,000	4,740,000	4,020,000	3,920,000	3,120,000
ie Forge Co.	234,000	234,000	234,000	85,000	80,000
ie Forge & Steel Co.					128,950
tional Forge & Ordnance Co.	25,000	25,000	25,000	25,000	25,000
public Steel Corp.	882,000	882,000	882,000	870,000	830,000
monds Saw & Steel Co.	21,600	21,600	21,600	21,600	21,600
lorado Fuel & Iron Corp.	252,000	252,000	240,000	240,000	180,000
TOTAL Buffalo District	6,452,100	6,192,100	5,460,100	5,199,100	4,423,050
eveland					
nes & Laughlin Steel Corp.	1,305,000	1,305,000	1,155,000	945,000	840,000
tional Tube Div.	2,364,000	2,320,000	2,300,000	2,250,000	1,884,000
public Steel Corp.	2,572,000	2,572,000	1,900,000	1,637,000	1,500,000
TOTAL Cleveland District	6,241,000	6,197,000	5,355,000	4,832,000	4,224,000

DISTRICT COMPANY	Rated Annual Capacity—Net Tons				
	1954	1953	1952	1951	1948
Southern					
Atlantic Steel Co.	300,000	300,000	188,000	188,000	165,000
Case Co., J. I.					74,400
Connors Steel Co.	67,500	67,500	60,000	60,000	60,000
Kilby Steel Co.	34,020	34,020	34,020	34,020	
Knoxville Iron Co.	38,000	38,000	38,000	38,000	38,000
Republic Steel Co.	789,000	789,000	789,000	745,000	650,000
Tennessee Coal Iron Div.					
Ensley	1,745,000	1,625,000	1,625,000	1,568,000	1,568,000
Fairfield	2,086,000	1,830,000	1,402,000	1,352,000	1,282,000
Total	3,831,000	3,455,000	3,027,000	2,920,000	2,850,000
TOTAL Southern District	5,059,520	4,683,520	4,136,020	3,985,020	3,837,400
South Ohio River					
Armco Steel Corp.					
Ashland	870,000	860,000	860,000	900,000	828,000
Middletown	1,697,000	1,548,000	1,505,000	1,540,000	972,000
Total	2,567,000	2,408,000	2,365,000	2,440,000	1,800,000
Detroit Steel Co.	1,290,000	660,000	650,000	650,000	720,000
Green River Steel Co.	241,920	198,000			
Newport Steel Corp.	708,500	708,500	708,500	704,700	413,100
West Virginia Steel & Mfg. Co.	68,000	78,840			
TOTAL South Ohio District	4,875,420	4,053,340	3,723,500	3,794,700	2,933,100
Wheeling					
Ohio River Steel Div.	136,080	136,080	136,080	121,200	136,080
National Steel Corp.					
Weirton Steel Co.	2,600,000	2,500,000	2,500,000	2,300,000	1,950,000
Wheeling Steel Corp.					
Benwood		420,000	420,000	429,000	336,000
Steubenville	2,130,000	1,440,000	1,440,000	1,440,000	1,073,000
Total		1,860,000	1,860,000	1,860,000	1,409,000
TOTAL Wheeling District	4,866,080	4,496,080	4,496,080	4,281,200	3,495,080
St. Louis					
Granite City Steel Co.	1,290 000	720,000	720,000	720,000	620,000
Keystone Steel & Wire Co.	425,000	400,000	400,000	325,000	302,400
Laclede Steel Co.	440,000	410,000	410,000	397,840	326,020
Sheffield Steel Corp. (Armco)	630,000	630,000	480,000	420,000	426,000
TOTAL St. Louis District	2,785,000	2,160,000	2,010,000	1,862,840	1,674,420
Eastern					
Allegheny Ludlum Steel Co.	77,000	77,000	30,000	25,000	25,000
American Steel & Wire Div.	287,000	275,000	275,000	250,000	250,000
Crucible Steel Co. of America					
Harrison	7,800	7,100	2,360	2,160	4,800
Syracuse		59,600	59,600	56,280	67,800
Halcomb	59,600				
Total	67,400	66,700	61,960	58,440	72,600
Stanley Works	188,280	188,280	188,280	188,280	188,200
Washburn Wire Co.	93,000	93,000	93,000	93,000	60,000
Wickwire Brothers, Inc.	19,830				38,800
TOTAL Eastern District	732,610	699,980	648,240	614,720	633,880

Steel Capacity

◆ Industry added 6,782,940 tons of steel capacity in 1953, now totaling 124,330,410 tons . . . Blast furnace capacity is now 82,001,390 tons.

◆ Chicago, boosting itself nearly 1.79 million tons, takes over as No. 1 steelmaking area . . . Detroit hikes electric capacity 26 pct while St. Louis rises 31 pct . . . Only Pittsburgh sagged.—*By R. L. Hatschek.*

Capacity of steelmaking facilities in the U. S. now stands at 124,330,410 net tons per year —an increase of 6,782,940 tons from the level of Jan. 1, 1953. The increase during 1953 compares with a boost of approximately 8.9 million tons during the preceding year.

Basis of this new compilation of the industry's potential by IRON AGE districts is the detailed official capacity report just published by the American Iron and Steel Institute.

By adding nearly 1.79 million tons, the Chicago area overtook Pittsburgh and now stands as the No. 1 IRON AGE steelmaking district with 19.78 pct of the country's capacity. Chicago area mills assured their leadership by topping all others in the amount of capacity added — 26.33 pct of the nation's increase.

Pittsburgh, the only district to show a decline, dropped more than half a million tons but remains firmly in second position. Now well entrenched in third, a position it took over from Youngstown only a year ago, the Philadelphia District added 1.55 million tons for 22.89 pct of the national gain. Western steelmakers maintained their fifth ranking.

Detroit leapfrogged over both Buffalo and Cleveland by adding nearly 11 pct of the nation's new facilities and the South Ohio River District also boosted itself a notch higher.

Percentagewise, the biggest bootstraps lift was done by St. Louis area steelmakers. They hiked themselves 31.09 pct over their 1953 rated capacity.

Most Electrics in Youngstown

Contrasted with the 23.98 pct gain in electric furnace capacity during the previous year, electrics went up only 2.11 pct in 1953, slipping a trifle from 8.69 pct of total capacity to 8.40 pct. Reason for this, of course, is that electrics can be put into operation considerably faster than openhearths so that the big gain came earlier.

Automotive demand for electric furnace steel and the favorable raw material situation in the Motor City pushed up Detroit's capacity in this category by 25.98 pct. Gains in other areas were small by comparison and the West recorded a decline in electric capacity of 18.96 pct. A slight decline in electric capacity was also reported in the Eastern District.

Youngstown held tightly to its position as biggest electric furnace district, pushing its total for this type furnace to over 2 million tons.

Bessemer steelmaking reversed its recent trend and showed an increase to 4,787,000 tons, 3.85 pct of total capacity.

Openhearth capacity was boosted 6,416,750 tons—nearly 95 pct of the total increment. This hike edged the openhearth percentage of all steelmaking furnaces to 87.75 pct.

Blast furnace capacity rose by 2,621,150 tons in 1953, bringing the total at the first of this year to 82,001,390 tons of pig iron and ferroalloys. Despite a 492,000-ton decline in beehive capacity, coke production facilities now total 73,239,540 tons—an increase of 2,058,350 tons.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE District	Pct of U. S. Capacity		Increase in Capacity		Pct of U. S. Increase	District Changes (Pct) By Type of Furnace		
	1954	1953	Net Tons	Pct		Open-hearth	Bessemer	Electric
Chicago	19.78	19.40	1,786,100	7.83	26.33	+ 8.73	0	+ 0.03
Pittsburgh	18.51	20.02	−516,820	−2.20	−7.62	− 2.47	0	+ 0.26
Philadelphia	13.18	12.62	1,552,720	10.47	22.89	+11.06	0	+ 3.37
Youngstown	11.18	11.62	231,800	1.70	3.42	+ 2.09	0	+ 1.14
West	7.14	7.15	479,650	5.71	7.07	+ 9.63	.....	−18.96
Detroit	5.27	4.94	744,880	12.83	10.98	+ 9.09	.....	+25.98
Buffalo	5.19	5.27	260,000	4.20	3.83	+ 4.26	.....	0
Cleveland	5.02	5.27	44,000	0.71	0.65	+ 0.83	0	.....
South	4.07	3.98	376,000	8.03	5.54	+ 8.48	.....	0
South Ohio River	3.92	3.45	822,080	20.28	12.12	+24.35	.....	+ 4.66
Wheeling	3.91	3.82	370,000	8.23	5.45	+ 5.40	+35.71	.....
St. Louis	2.24	1.84	625,000	28.94	9.21	+31.09	.....	0
East	0.59	0.62	7,530	1.04	0.11	+ 2.16	.....	− 2.65
Total	100.00	100.00	6,782,940	5.77	100.00	+ 6.25	+ 3.23	+ 2.11

Official Steel Industry Capacities

Source: American Iron and Steel Institute

THE IRON AGE DISTRICTS STEEL CAPACITY

In Thousands of Net Tons— *Source: American Iron and Steel Institute—Compilations: The Iron Age*

District	1954		1953		1952		1951		1948	
	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total
Chicago	24,587	19.78	22,801	19.40	20,249	18.65	19,760	18.91	18,856	20.01
Pittsburgh	23,016	18.51	23,533	20.02	22,765	20.96	22,406	21.44	20,829	22.10
Philadelphia	16,386	13.18	14,834	12.62	13,489	12.42	12,958	12.40	11,505	12.21
Youngstown	13,896	11.18	13,664	11.62	13,490	12.42	13,167	12.60	12,644	13.42
Western	8,883	7.14	8,404	7.15	7,635	7.03	6,878	6.58	5,706	6.06
Detroit	6,551	5.27	5,806	4.94	5,130	4.72	4,770	4.56	3,473	3.69
Cleveland	6,241	5.02	6,197	5.27	5,355	4.93	4,832	4.62	4,224	4.48
Buffalo	6,452	5.19	6,192	5.27	5,460	5.03	5,200	4.98	4,423	4.69
Southern	5,060	4.07	4,683	3.98	4,136	3.81	3,985	3.81	3,837	4.07
South Ohio River	4,875	3.92	4,053	3.45	3,724	3.43	3,795	3.63	2,933	3.11
Wheeling	4,866	3.91	4,496	3.82	4,496	4.14	4,281	4.10	3,495	3.71
St. Louis	2,785	2.24	2,160	1.84	2,010	1.85	1,863	1.78	1,674	1.78
Eastern	733	0.59	724	0.62	648	0.60	615	0.59	634	0.67
Total	124,330	100.00	117,547	100.00	108,588	100.00	104,503	100.00	94,233	100.00

BLAST FURNACE CAPACITY BY COMPANIES AND GEOGRAPHIC LO

Annual Capacity of Blast Furnaces as of January 1, 1954

	No. of stacks	Total annual capacity (N. T.)
Companies:		
Alan Wood Steel Company	2	454,800
Armco Steel Corporation	6	1,828,000
Sheffield Steel Corporation	1	360,000
TOTAL	7	2,188,000
Barium Steel Corporation:		
Chester Blast Furnace, Inc.	1	200,000
Berkman Company, Louis	1	136,800
Bethlehem Steel Company	33	(a) 12,400,000
Colorado Fuel and Iron Corporation	7	1,423,760
Crucible Steel Company of America	3	895,000
Detroit Steel Corporation	2	768,700
Eastern Gas and Fuel Associates	1	191,100
Ford Motor Company	3	1,120,000
Globe Iron Company	1	100,000
Granite City Steel Co.	2	450,000
Inland Steel Company	8	2,638,950
Interlake Iron Corporation	6	1,540,130
International Harvester Company	3	731,000
Jackson Iron & Steel Company	1	95,000
Jones & Laughlin Steel Corporation	13	4,467,000
Kaiser Steel Corporation	3	1,314,000
Lavino & Company, E. J.	2	(b) 112,000
Lone Star Steel Company	1	385,000
National Steel Corporation:		
Great Lakes Steel Corporation	4	1,680,000
Hanna Furnace Corporation	4	850,000
Weirton Steel Company	4	2,000,000
TOTAL	12	4,530,000
New Jersey Zinc Company	2	(c) 112,000
Pittsburgh Coke & Chemical Company	3	836,500
Pittsburgh Steel Company	3	954,000
Republic Steel Corporation	22	7,220,000
Sharon Steel Corporation	3	709,620
Shenango Furnace Company	2	445,450
Tennessee Products & Chemical Corp.	3	217,740
Tonawanda Iron Division	1	171,000
United States Pipe & Foundry Co.	4	491,710
United States Steel Corporation:		
United States Steel Corp. (Central Operations)	53	(d) 18,702,200
American Steel & Wire Division	6	1,429,400
Columbia-Geneva Steel Division	5	1,682,700

(a) Includes 216,000 tons ferroalloys capacity.
(b) Ferromanganese only.
(c) Spiegeleisen only.
(d) Includes 322,800 tons ferroalloys capacity.

Capacity of Blast Furnaces — January 1, 1954 (*Continued*)

	No. of stacks	Total annual capacity (N. T.)
Companies (*Continued*):		
National Tube Division	9	3,122,800
Tennessee Coal & Iron Division	9	(e) 3,063,000
TOTAL	82	(f) 28,000,100
Wheeling Steel Corporation	6	1,800,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,129,400
GRAND TOTAL	260	(g) 82,001,390
Plant Location and Operating Company:		
Alabama (Southern District)		
Birmingham		
Republic Steel Corporation	2	402,000
United States Pipe & Foundry Co.	2	281,230
Ensley		
Tennessee Coal & Iron Division	6	(e) 1,844,300
Fairfield		
Tennessee Coal & Iron Division	3	1,218,700
Gadsden		
Republic Steel Corporation	2	525,000
North Birmingham		
United States Pipe & Foundry Co.	2	210,480
Woodward		
Woodward Iron Company	4	772,630
TOTAL	21	(e) 5,254,340
California (Western District)		
Fontana		
Kaiser Steel Corporation	3	1,314,000
Colorado (Western District)		
Pueblo		
Colorado Fuel and Iron Corporation	4	882,560
Illinois (Chicago District)		
Chicago		
Interlake Iron Corporation	2	586,620
Granite City		
Granite City Steel Co.	2	450,000
South Chicago		
International Harvester Company	3	731,000
Republic Steel Corporation	1	455,000
United States Steel Corp. (Central Operations)	11	4,196,700
Youngstown Sheet and Tube Company	3	684,000
TOTAL	22	7,103,320

(e) Includes 35,000 tons ferroalloys capacity.
(f) Includes 357,800 tons ferroalloys capacity.
(g) Includes 797,800 tons ferroalloys capacity.

Capacity of Blast Furn

Indiana (Chicago
East Chicago
Youngstown Sheet and
Gary
United States Steel Co
Operations)
Indiana Harbor
Inland Steel Company
TOTAL

Kentucky
(Pittsburgh - Young
Ashland
Armco Steel Corporati

Maryland (Easter
Sparrows Point
Bethlehem Steel Comp

Massachusetts (East
Everett
Eastern Gas and Fuel

Michigan (Cleveland -
Dearborn
Ford Motor Company
River Rouge
Great Lakes Steel Cor
TOTAL

Minnesota (Chicag
Duluth
American Steel & Wir
Interlake Iron Corpor
TOTAL

New York (Easte
Buffalo
Hanna Furnace Corpo
Republic Steel Corpor
Lackawanna
Bethlehem Steel Comp
North Tonawanda
Tonawanda Iron Divi
Tonawanda
Colorado Fuel & Iron
Troy
Republic Steel Corpor
TOTAL

STEEL CAPACITY BY COMPANIES AN

Annual Steel Capacity (Ingots and Steel for Castings) as of January 1, 1954

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:							
Open hearth—basic	901	108,279,490	....	.....	....	.....	108,279,490
Open hearth—acid	33	815,240	....	.....	....	.....	815,240
Bessemer	....	.....	(d) 33	4,787,000	....	.....	4,787,000
Electric	....	.....	....	.....	255	10,448,640	10,448,640
Crucible	....	.....	....	.....	1'	40	40
TOTAL	934	109,094,730	(d) 33	4,787,000	256	10,448,680	124,330,410
Companies:							
Alan Wood Steel Co.	8	625,000	....	.....	....	.....	625,000
Allegheny Ludlum Steel Corporation	6	240,000	....	.....	28	624,200	864,200
American Locomotive Co.	6	181,000	....	.....	....	.....	181,000
Armco Steel Corporation	25	2,762,000	....	.....	9	406,000	3,168,000
Sheffield Steel Corp.	14	1,434,000	....	.....	2	300,000	1,734,000
TOTAL	39	4,196,000	....	.....	11	706,000	4,902,000
Atlantic Steel Company	3	188,000	....	.....	1	112,000	300,000
Babcock & Wilcox Company	....	.....	....	.....	4	229,450	229,450
Baldwin-Lima-Hamilton Corp.	5	169,920	....	.....	(a) 1	40	169,960
Barium Steel Corporation:							
Central Iron & Steel Co.	5	360,000	....	.....	1	46,000	406,000
Industrial Forge & Steel, Inc.	2	48,600	....	.....	....	.....	48,600
Phoenix Iron & Steel Co.	6	432,000	....	.....	....	.....	432,000
TOTAL	13	840,600	....	.....	1	46,000	886,600
Bethlehem Steel Corp:							
Bethlehem Steel Co.	126	17,106,000	3	336,000	4	158,000	17,600,000
Bethlehem Pacific Coast Steel Corp.	10	498,000	....	.....	3	402,000	900,000
TOTAL	136	17,604,000	3	336,000	7	560,000	18,500,000
Borg-Warner Corporation	....	.....	....	.....	4	64,000	64,000
Braeburn Alloy Steel Corp.	....	.....	....	.....	2	20,730	20,730
Byers Company, A. M.	....	.....	....	.....	2	75,000	75,000
Cabot Shops, Inc.	....	.....	....	.....	1	12,000	12,000
Cameron Iron Works, Inc.	....	.....	....	.....	2	58,800	58,800
Carpenter Steel Company	....	.....	....	.....	7	85,800	85,800
Colorado Fuel & Iron Corp.	27	2,231,570	....	.....	....	.....	2,231,570
Roebling's Sons Corp., J. A.	9	235,000	....	.....	....	.....	235,000
TOTAL	36	2,466,570	....	.....	....	.....	2,466,570

Steel Capacity (Ingots and Steel for Castings) January 1, 1954 (*Continued*)

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies (*Continued*):							
Columbia Tool Steel Co.	....	.....	....	.....	2	6,600	6,600
Connors Steel Co.	....	.....	....	.....	3	67,500	67,500
Continental Steel Corp.	5	394,000	....	.....	....	.....	394,000
Copperweld Steel Co.	....	.....	....	.....	7	618,380	618,380
Crucible Steel Company of America	9	972,000	....	.....	17	379,400	1,351,400
Damascus Tube Co.	....	.....	....	.....	3	1,800	1,800
Detroit Steel Corp.	14	1,290,000	....	.....	....	.....	1,290,000
Disston & Sons, Inc., Henry	....	.....	....	.....	3	25,000	25,000
Eastern Stainless Steel Corp.	....	.....	....	.....	3	32,000	32,000
Edgewater Steel Co.	3	89,890	....	.....	....	.....	89,890
Empire Steel Corporation	7	455,000	....	.....	....	.....	455,000
Erie Forge & Steel Corp.	5	234,000	....	.....	....	.....	234,000
Finkl & Sons Co., A.	....	.....	....	.....	2	33,600	33,600
Firth Sterling Inc.	....	.....	....	.....	3	20,040	20,040
Ford Motor Company	10	1,531,000	....	.....	5	224,000	1,755,000
Granite City Steel Co.	16	1,290,000	....	.....	....	.....	1,290,000
Green River Steel Corp.	....	.....	....	.....	3	241,920	241,920
Harrisburg Steel Corp.	3	100,750	....	.....	....	.....	100,750
Heppenstall Company	2	50,470	....	.....	1	5,080	55,550
Hoster Steel Corporation	....	.....	....	.....	1	16,920	16,920
Inland Steel Company	40	4,700,000	....	.....	....	.....	4,700,000
International Harvester Company	11	1,000,000	....	.....	....	.....	1,000,000
Isaacson Iron Works	....	.....	....	.....	2	102,000	102,000
Jessop Steel Company	....	.....	....	.....	4	33,490	33,490
Jones & Laughlin Steel Corporation	37	5,583,000	3	583,000	1	1,500	6,166,500
Joslyn Mfg. & Supply Co.	....	.....	....	.....	3	37,500	37,500
Judson Steel Corporation	3	76,500	....	.....	....	.....	76,500
Kaiser Steel Corp.	9	1,536,000	....	.....	....	.....	1,536,000
Keystone Steel & Wire Co.	4	435,000	....	.....	....	.....	435,000
Kilby Steel Company	....	.....	....	.....	1	34,020	34,020
Knoxville Iron Company	....	.....	....	.....	2	38,000	38,000
Laclede Steel Company	4	440,000	....	.....	....	.....	440,000
Latrobe Steel Company	....	.....	....	.....	5	24,000	b 24,000
Le Tourneau, Inc., R. G.	....	.....	....	.....	3	83,100	83,100
Lone Star Steel Co.	4	550,000	....	.....	....	.....	550,000
Lukens Steel Company	12	750,000	....	.....	....	.....	750,000
McLouth Steel Corporation	....	.....	....	.....	6	967,780	967,780
Mesta Machine Company	4	85,000	....	.....	1	20,000	105,000
Midvale Company	4	180,600	....	.....	7	172,770	353,370
Milton Steel Products Division Merritt-Chapman & Scott Corp.	....	.....	....	.....	2	43,000	43,000
National Forge & Ordnance Company	....	.....	....	.....	3	25,000	25,000
National Steel Corp.:							
Great Lakes Steel Corp.	17	3,400,000	(b) 2	.....	....	.....	3,400,000
Weirton Steel Co.	13	2,600,000	(b) 2	.....	....	.....	2,600,000
TOTAL	30	6,000,000	(b) 4	.....	....	.....	6,000,000

HIC LOCATION

acity of Blast Furnaces — January 1, 1954 (*Continued*)

	No. of stacks	Total annual capacity (N. T.)
Indiana (Chicago District)		
Chicago		
ngstown Sheet and Tube Company	3	1,292,600
ed States Steel Corp. (Central erations)	12	4,755,400
na Harbor		
nd Steel Company	8	2,638,950
TOTAL	23	8,686,950
Kentucky		
ittsburgh - Youngstown District)		
nd		
co Steel Corporation	3	802,000
Maryland (Eastern District)		
ows Point		
hlehem Steel Company	9	4,116,000
assachusetts (Eastern District)		
ett		
tern Gas and Fuel Associates	1	191,100
higan (Cleveland - Detroit Dist.)		
born		
l Motor Company	3	1,120,000
- Rouge		
at Lakes Steel Corporation	4	1,680,000
TOTAL	7	2,800,000
Minnesota (Chicago District)		
th		
erican Steel & Wire Division	2	449,400
rlake Iron Corporation	1	131,580
TOTAL	3	580,980
New York (Eastern District)		
lo		
na Furnace Corporation	4	850,000
ublic Steel Corporation	2	618,000
awanna		
hlehem Steel Company	7	3,036,000
h Tonawanda		
awanda Iron Division	1	171,000
wanda		
orado Fuel & Iron Corporation	2	390,000
ublic Steel Corporation	1	263,000
TOTAL	17	5,328,000

Capacity of Blast Furnaces — January 1, 1954 (*Continued*)

	No. of stacks	Total annual capacity (N. T.)
Ohio (Pittsburgh - Youngstown District)		
Campbell		
Youngstown Sheet and Tube Company	4	1,450,800
Canton		
Republic Steel Corporation	1	235,000
Hubbard		
Youngstown Sheet and Tube Company	1	200,400
Jackson		
Globe Iron Company	1	100,000
Jackson Iron & Steel Company	1	95,000
Lowellville		
Sharon Steel Corporation	1	148,620
Martins Ferry		
Louis Berkman Company	1	136,800
Massillon		
Republic Steel Corporation	1	238,000
Middletown		
Armco Steel Corporation	1	502,000
New Miami		
Armco Steel Corporation	2	524,000
Portsmouth		
Detroit Steel Corporation	2	768,700
Steubenville		
Wheeling Steel Corporation	5	1,554,000
Struthers		
Pittsburgh Coke & Chemical Company	1	182,500
Warren		
Republic Steel Corporation	1	516,000
Youngstown		
Republic Steel Corporation	5	1,717,000
United States Steel Corp. (Central Operations)	6	2,003,700
Youngstown Sheet and Tube Company	2	501,600
SubTotal (Pitts. - Youngs. Dist.)	36	10,874,120
Ohio (Cleveland - Detroit District)		
Cleveland		
American Steel & Wire Division	2	530,000
Jones & Laughlin Steel Corporation	2	740,000
Republic Steel Corporation	6	2,251,000
Lorain		
National Tube Division	5	1,842,500
Toledo		
Interlake Iron Corporation	2	551,180
SubTotal (Clev. - Det. Dist.)	17	5,914,680
TOTAL—Ohio	53	16,788,800
Pennsylvania (Pittsburgh - Youngstown District)		
Aliquippa		
Jones & Laughlin Steel Corporation	5	1,800,000
Braddock		
United States Steel Corp. (Central Operations)	7	2,602,700

Capacity of Blast Furnaces — January 1, 1954 (Co

	No. of stacks
Pennsylvania (Pittsburgh-Youngstown District) (*Continued*)	
Clairton	
United States Steel Corp. (Central Operations)	3
Donora	
American Steel & Wire Division	2
Duquesne	
United States Steel Corp. (Central Operations)	6
Farrell	
Sharon Steel Corporation	2
McKeesport	
National Tube Division	4
Midland	
Crucible Steel Company of America	3
Monessen	
Pittsburgh Steel Company	3
Neville Island	
Pittsburgh Coke & Chemical Company	2
Pittsburgh	
Jones & Laughlin Steel Corporation	6
Rankin	
United States Steel Corp. (Central Operations)	6
Sharpsville	
Shenango Furnace Company	2
SubTotal (Pitts. - Youngs. Dist.)	51
Pennsylvania (Eastern District)	
Bethlehem	
Bethlehem Steel Company	7
Birdsboro	
Colorado Fuel and Iron Corporation	1
Chester	
Chester Blast Furnace, Inc.	1
Erie	
Interlake Iron Corporation	1
Johnstown	
Bethlehem Steel Company	7
Morrisville	
United States Steel Corp. (Central Operations)	2
Palmerton	
New Jersey Zinc Company	2
Sheridan	
Lavino and Company, E. J.	1
Steelton	
Bethlehem Steel Company	3
Swedeland	
Alan Wood Steel Company	2
SubTotal (Eastern Dist.)	27
TOTAL—Pennsylvania	78

(a) Includes 85,200 tons ferroalloys capacity.
(b) Includes 237,600 tons ferroalloys capacity.
(c) Includes 216,000 tons ferroalloys capacity.
(d) Spiegeleisen only.
(e) Ferromanganese only.
(f) Includes 706,800 tons ferroalloys capacity.

AND TYPES

COKE CAPACITY

Steel Capacity (Ingots and Steel for Castings) January 1, 1954 (*Continued*)

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies (*Continued*):							
National Supply Co.	....	.....	....	.....	3	50,200	50,200
Newport News Shipbuilding & Dry Dock Co.	....	.....	....	.....	3	12,000	12,000
Newport Steel Corp.	7	375,300	....	.....	3	333,200	708,500
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	2	42,000	42,000
Northwestern Steel & Wire Co.	....	.....	....	.....	5	825,000	825,000
Ohio River Steel Div., Louis Berkman Company	4	136,080	....	.....	....	.....	136,080
Oregon Steel Mills	....	.....	....	.....	3	110,000	110,000
Pacific States Steel Corp.	3	181,770	....	.....	....	.....	181,770
Pittsburgh Steel Co.	12	1,404,000	....	.....	....	.....	1,404,000
Republic Steel Corp.	78	8,222,000	2	665,000	26	1,375,000	10,262,000
Rotary Electric Steel Co.	....	.....	....	.....	6	425,000	425,000
Sharon Steel Corp.	17	1,478,000	....	.....	3	72,000	1,550,000
Simonds Saw & Steel Co.	....	.....	....	.....	3	21,600	21,600
Southwest Steel Rolling Mills	....	.....	....	.....	1	45,000	45,000
Stanley Works	3	188,280	....	.....	....	.....	188,280
Texas Steel Company	....	.....	....	.....	2	36,000	36,000
Timken Roller Bearing Company	....	.....	....	.....	9	648,000	648,000
Union Electric Steel Corp.	....	.....	....	.....	2	26,760	26,760
United States Steel Corp.:							
United States Steel Corp. (Central Operations)	183	24,664,000	(c) 8	1,284,000	9	357,000	26,305,000
American Steel & Wire Div.	26	2,275,000	....	.....	....	.....	2,275,000
Columbia-Geneva Steel Div.	19	2,482,000	....	.....	1	12,000	2,494,000
National Tube Div.	15	2,700,000	6	1,110,000	....	.....	3,810,000
Tennessee Coal & Iron Div.	23	3,831,000	(b) 3	.....	....	.....	3,831,000
TOTAL	266	35,952,000	17	2,394,000	10	369,000	38,715,000
Universal-Cyclops Steel Corporation	....	.....	....	.....	5	70,160	70,160
Vanadium-Alloys Steel Co.	....	.....	....	.....	3	11,910	11,910
Colonial Steel Co.	....	.....	....	.....	2	30,000	30,000
TOTAL	....	.....	....	.....	5	41,910	41,910
Vulcan Crucible Steel Co.	....	.....	....	.....	2	9,600	9,600
Washburn Wire Co.	4	93,000	....	.....	....	.....	93,000
West Virginia Steel & Mfg. Co.	....	.....	....	.....	1	68,000	68,000
Wheeling Steel Corp.	11	1,560,000	2	570,000	....	.....	2,130,000
Wickwire Brothers, Inc.	....	.....	....	.....	1	19,830	19,830
Youngstown Sheet and Tube Company	41	5,260,000	2	240,000	....	.....	5,500,000
GRAND TOTAL	934	109,094,730	(d) 33	4,787,000	(e) 256	10,448,680	124,330,410

Annual Coke Capacity as of January 1, 1954

	BEEHIVE		OTHER		
	No. of ovens	Annual capacity (N. T.)	No. of ovens	Annual capacity (N. T.)	Total annual capacity (N. T.)
Companies:					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
Armco Steel Corporation	.....	.....	186	990,000	990,000
Sheffield Steel Corporation	.....	.....	62	318,000	318,000
TOTAL	.....	.....	248	1,308,000	1,308,000
Bethlehem Steel Company	.....	.....	2,208	11,330,000	11,330,000
Colorado Fuel and Iron Corporation	.....	.....	266	1,220,000	1,220,000
Crucible Steel Company of America	.....	.....	213	831,600	831,600
Detroit Steel Corporation	.....	.....	108	510,000	510,000
Eastern Gas and Fuel Associates	.....	.....	106	666,000	666,000
Ford Motor Company	.....	.....	220	1,372,650	1,372,650
Granite City Steel Co.	.....	.....	76	450,000	450,000
Inland Steel Company	.....	.....	418	2,143,400	2,143,400
Interlake Iron Corporation	.....	.....	390	1,494,000	1,494,000
International Harvester Company	.....	.....	148	664,300	664,300
Jones & Laughlin Steel Corporation	.....	.....	831	4,068,000	4,068,000
Kaiser Steel Corporation	297	100,000	225	1,006,000	1,106,000
Lone Star Steel Company	.....	.....	78	438,000	438,000
National Steel Corporation:					
Great Lakes Steel Corporation	.....	.....	216	1,600,000	1,600,000
Hanna Furnace Corporation	.....	.....	126	*661,500	*661,500
Weirton Coal Company	136	130,000	.....	.....	130,000
Weirton Steel Company	.....	.....	249	1,620,000	1,620,000
TOTAL	136	130,000	591	3,881,500	4,011,500
Pittsburgh Coke & Chemical Company	.....	.....	140	1,000,000	1,000,000
Pittsburgh Steel Company	574	426,000	74	500,000	926,000
Republic Steel Corporation	296	215,000	1,223	*6,663,500	*6,878,500
Sharon Steel Corporation	.....	.....	60	225,000	225,000
Carpentertown Coal & Coke Co.	585	375,000	.....	.....	375,000
TOTAL	585	375,000	60	225,000	600,000
Tennessee Products & Chemical Corp.	.....	.....	150	800,000	800,000
United States Pipe & Foundry Co.	.....	.....	44	251,500	251,500
United States Steel Corporation:					
United States Steel Corp. (Central Operations)	2,912	2,073,750	3,183	15,317,070	17,390,820
American Steel & Wire Division	.....	.....	295	1,332,670	1,332,670
Columbia-Geneva Steel Division	.....	.....	308	1,212,300	1,212,300
National Tube Division	.....	.....	385	1,766,750	1,766,750
Tennessee Coal & Iron Division	.....	.....	572	2,945,550	2,945,550
TOTAL	2,912	2,073,750	4,743	22,574,340	24,648,090
Wheeling Steel Corporation	.....	.....	314	1,720,000	1,720,000
Woodward Iron Company	.....	.....	256	938,000	938,000
Youngstown Sheet and Tube Company	.....	.....	655	3,234,000	3,234,000
GRAND TOTAL	4,800	3,309,750	13,937	69,929,790	73,239,540

* Includes 50% of coke capacity of the Donner-Hanna Coke Corporation, Buffalo, New York

(*Continued*)

of	Total annual capacity (N. T.)
3	(a) 614,000
2	450,000
6	(b) 1,262,700
2	561,000
4	1,280,300
3	895,000
3	954,000
2	654,000
6	1,927,000
6	2,133,000
2	445,450
1	15,579,150
7	2,708,000
1	151,200
1	200,000
1	270,750
7	(c) 1,664,000
2	1,134,000
2	(d) 112,000
1	(e) 56,000
3	876,000
2	454,800
7	7,626,750
5	(f) 23,205,900

Capacity of Blast Furnaces — January 1, 1954 (*Continued*)

	No. of stacks	Total annual capacity (N. T.)
Tennessee (Southern District)		
Lyles-Wrigley		
Tennessee Products & Chemical Corp.	1	36,300
Rockwood		
Tennessee Products & Chemical Corp.	2	181,440
TOTAL	3	217,740
Texas (Southern District)		
Houston		
Sheffield Steel Corporation	1	360,000
Lone Star		
Lone Star Steel Company	1	385,000
TOTAL	2	745,000
Utah (Western District)		
Geneva		
Columbia-Geneva Steel Division	3	1,200,000
Provo		
Columbia-Geneva Steel Division	2	482,700
TOTAL	5	1,682,700
Virginia (Southern District)		
Lynchburg		
Lavino and Company, E. J.	1	(a) 56,000
West Virginia (Pittsburgh - Youngstown District)		
Benwood		
Wheeling Steel Corporation	1	246,000
Weirton		
Weirton Steel Company	4	2,000,000
TOTAL	5	2,246,000
DISTRIBUTION BY DISTRICTS:		
Eastern	54	(b) 17,261,850
Pittsburgh-Youngstown	95	(c) 29,501,270
Cleveland-Detroit	24	8,714,680
Chicago	48	16,371,250
Southern	27	(d) 6,273,080
Western	12	3,879,260
TOTAL	260	(e) 82,001,390

(a) Ferromanganese only.
(b) Includes 384,000 tons ferroalloys capacity.
(c) Includes 322,800 tons ferroalloys capacity.
(d) Includes 91,000 tons ferroalloys capacity.
(e) Includes 797,800 tons ferroalloys capacity.

The Iron Age

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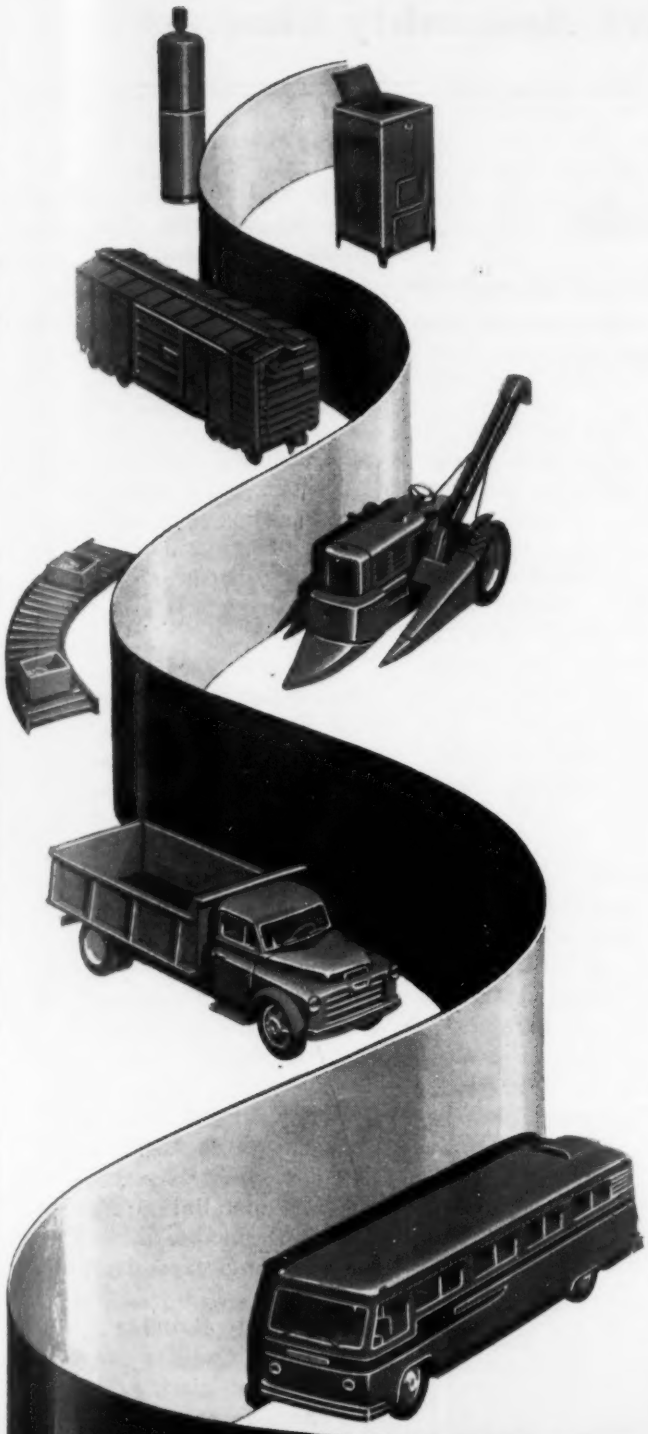

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GM Parcels Out Expansion Bundle

Largest expenditures slated for machine tools, plant modernization . . . Market share main basis for allocations to auto divisions . . . But some get less—By *R. D. Raddant.*

Pattern of General Motors' billion - dollar expansion bundle started to become clear last week as divisions outlined to some extent how they are to participate in the program.

Scope of the expansion, much of which will be completed this year, must be bad news for competitors unless they are equipped or willing to match GM's plans.

Tools Take Most . . . While a lot of the $1 billion will go toward increasing floor space through new plants and additions, largest expenditures are planned for machine tools to do the work faster and at greater economy and to modernize existing facilities in foundries, plating plants and the like.

No dollar breakdown of expenditures was disclosed and guessing in terms of spending is impractical. In general, automotive divisions will receive in proportion to their share of the market, although some benefited more from GM's earlier $2 billion capital investment and appear to be getting less of the new appropriation.

Chevvy Well Underway . . . For example, Chevrolet's current expansion will add 22 pct to its nationwide capacity, according to T. H. Keating, Chevrolet general manager. Chevrolet has 30 manufacturing and assembly plants and a total of 5 million sq ft of new plants and additions under construction.

But all of Chevrolet's plants are to be completed, with automobile production in them, later in 1954. This indicates that Chevrolet got most of its projects underway before the new program was announced. This was no doubt because of its determination to stay ahead of Ford, which has had more than $1 billion for expansion.

Chevrolet's program is spread throughout its fast-expanding facilities in Buffalo, 750,000 additional sq ft added to its Flint stamping and frame plant, completion of a new spring and bumper plant near Detroit, and Chevrolet's new engineering center adjacent to the huge GM technical center north of Detroit.

Up Shift Output . . . Buick's program will be completed in 1955. Bulk of expansion will include purchase of new machinery to be installed in the former straight-8 engine plant and the area made vacant by termination of a tank transmission program. The new expenditures will increase Dynaflow production by nearly 500 units daily and will more than double foundry capacity. Production of axles and capacity of the forge shop will also be increased.

SYNTHETIC SUNLIGHT made by Fade-Ometer device used by Hudson Motor Car Co. to test fabrics, paint, for fading.

Six new 108-in. hot blast cupolas will be added to the foundry to increase its capacity to 2800 tons daily on a two-shift basis. In all, about 150,000 sq ft of new construction will be added to Buick, but this is small compared to nearly 1.5 million sq ft made available from closing out the tank contract and discontinuing straight-8 production.

Pontiac Is Prodigal . . . Pontiac, often called GM's orphan division, will have no cause to complain over an expansion program that will add more than 1.3 million sq ft of space plus vast modernization of facilities and millions for machine tools.

Pontiac's program includes a new sheet metal and press plant, addition to the foundry with new coremaking and molding facilities, a new building for factory delivery of dealer customer cars, a new car finish building, new shipping facilities, 3½ story addition to personnel and purchasing building, a new service parts machine building, and installation of a second automatic bumper plating system for additional capacity.

Boost Body Building . . . Oldsmobile and Cadillac are both installing new plating plants and will share in new tools and modernization programs to balance out their production systems. Much of Oldsmobile's program, in addition to the plating plant, will go to establishing greater overall efficiency. GMC Coach & Truck's share will also include large expenditures for machine tools and equipment to modernize existing facilities.

Fisher Body expansion plans will add over 1 million sq ft to the division's body building facilities. Most of the billion will go into automotive divisions, although

some will be spread over such divisions as Electromotive, Frigidaire, and possibly others.

Revise Strength Output . . . Production cuts in the top three producers, Ford, Plymouth, and Chevrolet, last week pointed to revised estimates of the strength of the auto market.

Ward's Automotive Reports, the statistical gospel, reports the industry has cut back its original first quarter production schedules by 12 pct, or about 200,000 units. This means that first quarter totals will be about 1,491,000 compared with 1,520,013 cars that were produced in the same period a year ago.

The setbacks among the three low-priced manufacturers represent only a reduction in overtime with high dealer stocks taking the blame. Early in January other Chrysler divisions and independents lowered their production sights, but it was the first sign of concern by Ford and Chevrolet in particular.

In Ford, for example, plants have been running on 9½-hour shifts with Saturday operations. Workers will now be on 8-hour days with plants operating on two shifts.

Report Reveals Merger Details

An adjusted financial report for the first 9 months of 1953 issued last week by Hudson reveals indirectly some of the inner workings of the recent merger with Nash-Kelvinator.

The new report indicates a loss of $6,465,197 instead of the previous report of a loss of $831,100. The variance shows up largely in "an estimated federal income tax carryback credit of $6,770,034."

This adjusted report reflects a review of the company's tooling investment based on a lower than expected volume of car shipments for 1953 and revised estimates of volume for 1954 and 1955.

This generally confirms reports that one obstacle in Nash-Hudson merger talks was the Hudson Jet. It had not reached volume to write off tooling costs. Hudson wanted its tooling included in assets but Nash insisted on eliminating the Jet and wiping out its tooling as an asset. There has been no announcement about future Jet plans, but the new financial statement tends to substantiate this theory. It may not mean the immediate end of the Jet, but it does indicate a review of tooling assets with the Jet program as the most likely target.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Jan. 30, 1954..	121,280*	25,611*
Jan. 23, 1954..	121,157	24,711
Jan. 31, 1953..	125,283	24,006
Jan. 24, 1953..	120,314	29,236

*Estimated. Source: *Ward's Reports*

Expansion:

Ford finishes 66 pct enlargement of Canton Forge Plant.

With all the talk about GM's $1-billion program, the fact that Ford's own $1-billion-plus program has been continuing has been almost obscured.

One important part of it reached completion last week with the final touches on the expansion and modernization of the Canton Forge Plant. It was enlarged 66 pct plus the addition of new office area, training department and laboratories.

In the plant, 95 different forgings are made, ranging from ½-lb connecting rod caps to 41½-lb tractor axles. About 425 tons of parts are forged each day.

New developments include elevation of many forging units and furnaces for improved handling and housekeeping and an extrusion method for ball-joint spindles.

In extruding the spindles, the billets are heated by an electric induction coil, then checked electronically for correct temperature. If not the proper heat, they are automatically diverted for reheating. The company also makes a larger share of its dies in the enlarged die shop at the plant.

THE BULL OF THE WOODS — By J. R. Williams

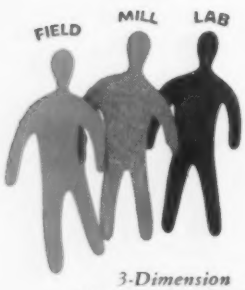
ALLOY STEEL PROBLEMS SHOULD BE VIEWED FROM *3 Angles*

And that's just what Republic's 3-D Metallurgical Field Service does.

The Republic Field Metallurgist gets the first look at your problem, right in your plant. He talks to your plant and engineering staff, studies your product, examines your production methods. His report goes back to the Republic Mill and Laboratory Metallurgists.

Then these three men discuss the report. They pool their combined knowledge of alloy steels, forging, machining and heat-treating, and check it against your problem. Their final recommendation is tailored to your plant, within your cost limits, to give you the quality your product requires at the speed you need to show a profit.

Are you sure you're getting all the advantages you should from your alloy steels? If you're not, it may pay you to call in Republic's 3-D Metallurgical Service. It's available, at no charge, through your local Republic Steel Sales Office.



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Predict Spring Employment Upsurge

White House economists find first half job outlook favorable overall . . . But ordnance, shipbuilding may face further layoffs . . . Not worried over jobless—By G. H. Baker.

Industrial unemployment, now estimated at slightly more than 2 million, is beginning to taper off in some areas and may start on the downward trend by mid-March.

Ordnance and shipbuilding industries may find it necessary to lop off additional workers in the weeks ahead. But the overall employment outlook for first-half 1954 is definitely favorable, as Administration economists see it.

Not Worrisome . . . White House economic view is that a nationwide total of 2 million unemployed is nothing to be concerned about. During the 1949-50 recession, unemployment hit the 4.6 million mark, and there were no serious dislocations resulting.

The Administration's anti-recession "tools" (public works, lower taxes, easier credit) are not going to be drawn upon at this time. (For detailed report of White House anti-recession plans, see p. 95, this issue). These are to be held in reserve in case real trouble breaks out.

Congress Checks . . . Congress, meanwhile, intends to take its own close look at the current economic picture. Chairman Wolcott, R., Mich., of the Senate-House Economic Committee this week opened public hearings on Administration policies with respect to business, industry, finance, agriculture, and labor. Treasury Secretary Humphrey heads a long list of witnesses. Mr. Wolcott intends to explode the "depression talk" originating on the Democratic side of the aisles. "There isn't any economic justification whatever for any of these mouthings of the prophets of doom," he declares. "It is all politically-motivated and the hearings, I think, will show that."

Air Gets Going . . . Favorable congressional reaction to Defense Secretary Wilson's "new look" defense concept sparks far-reaching Air Force procurement plans.

In the new fiscal year starting July 1, Air Force will get almost 40 pct of the total $31 billion defense budget. But the trend toward bigger Air Force spending is just getting under way.

Long-pull defense plans call for a step-by-step buildup in air operations and spending. Increasing emphasis on air and atomic defense weapons, rather than on traditional Army and Navy concepts of armament, is the nub of Mr. Wilson's defense philosophy.

Boost Defense . . . Result is that the Air Force is now able to map a substantial increase in its defense command without subtracting from its other operations because atomic bombs are now very much smaller in size and weight without loss of explosive power. Bombs can thus be delivered by small tactical planes capable of performing multiple duties.

Air Force chiefs now estimate that they can operate 137 wings with 970,000 men, as compared with earlier plans for a total force of 1,200,000 men operating 143 wings.

Need More Reactors

Atomic Energy Commission would like to create more interest in the building, by institutions, of nuclear reactors for research and engineer training, says Rep. Carl Hinshaw, R., Calif.

In his capacity as chairman of a Joint Atomic Energy Reactor subcommittee in Congress, Mr. Hinshaw finds AEC "very much interested" in promoting reactor construction by universities and other research centers. The agency has approved applications by two institutions for fissionable material to fuel the atomic furnaces, and now has other applications on hand, but it hopes to get more.

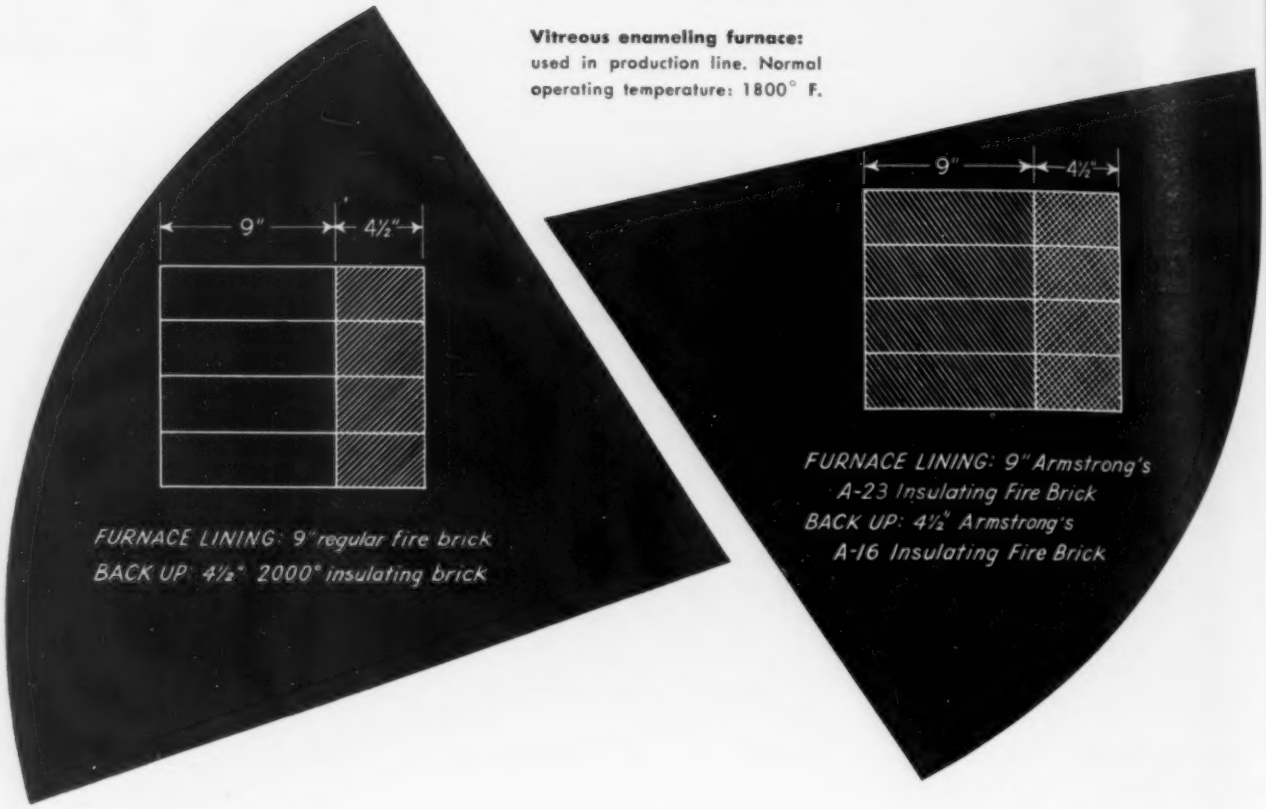
Reverse Labor Rulings . . . Pattern of future decisions issued by National Labor Relations Board probably will include at least several reversals of Truman Administration labor-management rulings. However, the board will lean over backward to avoid any charge that it is a "pro-business" board. Says NLRB Chairman Guy Farmer: "Our philosophy is pro-public."

Under the Eisenhower Administration, the board has reversed a number of decisions made by earlier boards. Mr. Farmer now discloses that more reversals are in the offing. "My job," he says, "is to interpret the law as I read it, not as somebody else who preceded me thought it should read."

Repeal "Improper" Acts . . . In answer to charges that the new board is improperly performing "legislative" functions, Mr. Farmer retorts:

"If it be true that we have legislated, we have done nothing more than repeal any improper legislative act of the prior board."

NLRB is to extend, in the coming months, its policy of steering clear of strictly local disputes. Only cases



Vitreous enameling furnace: used in production line. Normal operating temperature: 1800° F.

Which furnace wall construction cuts fuel consumption?

Valuable fuel savings and increased furnace efficiency often can be effected by a simple change in wall construction.

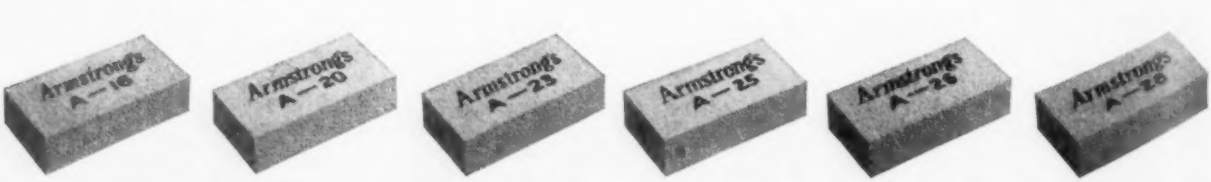
For example, the furnace design on the left shows a lining of 9″ of regular fire brick with 4½″ of 2000° insulating brick used as back-up. Heat loss through this construction is 345 Btu's per square foot. Heat storage is 41,439 Btu's, and the wall surface temperature is about 220° F.

Performance improves noticeably when the second, more modern design is used. The furnace lining is 9″ of Armstrong's A-23 Insulating Fire Brick, while the back-up is 4½″ of Armstrong's A-16. With this construction, heat storage is only 14,014 Btu's —a 65% reduction. The wall surface temperature has dropped to about 170° F. Most important of all, heat loss has been cut by 37% . . . to only 216 Btu's per hour per square foot of furnace wall area!

Since this furnace is part of a production line, the reduction in exterior surface temperature promotes greater comfort for the workmen. The lower heat loss assures valuable fuel savings as well as greater operating efficiency.

Do you have a furnace problem?

Selecting the right insulating fire brick calls for expert knowledge of brick performance and furnace construction. That's why it's always a smart idea to call in your Armstrong engineer whenever you have a furnace to be built or relined. He'll be glad to help you choose the best brick for your particular job. For his help, call your nearest Armstrong office or write Armstrong Cork Company, 2702 Susquehanna St., Lancaster, Penna.



ARMSTRONG'S INSULATING REFRACTORIES

that have "a real and substantial impact" on interstate commerce will be processed. Continued withdrawal from local and regional matters will free board members and public funds for concentration on cases of national interest.

Turkey Talks It . . . Details of a new law aimed at attracting more American business capital to Turkey were released in Washington last week simultaneously with the visit of Turkish President Bayar.

There is now no time limit for repatriation of capital, it is explained. Formerly, cash outlay had to stay in Turkey for a minimum of 3 years while capital equipment was frozen for 5 years.

Likewise, there are now no restrictions on transfer of profits, dividends or interest which had previously been held to an amount not exceeding 10 pct of base investment.

Equally important is the provision which allows the Turkish finance minister to give a government guarantee covering foreign business loans up to an aggregate of $357 million, which is equal to 1 billion Turkish lira.

Investments in Turkish industry and business made by foreigners since August 1951 are automatically guaranteed.

Protest Leasing Govt. Tools

Representatives of the machine tool and metalworking equipment industries have registered with the government their flat opposition to leasing of its equipment except for defense work.

In a meeting with government officials, industry spokesmen urged that Business & Defense Services Administration press for a complete and accurate inventory of all government-owned metalworking equipment.

Also, the industrialists have recommended through BDSA that steps be taken immediately to drop what amounts to a policy of subsidizing foreign competitors, especially machine tool makers.

Agreements with Western Germany provide a particularly sore point with the manufacturers. That country has more than 1000 machine tool builders compared to between 300 and 400 in the U. S.

Mobilization:

Industry's M-Day assignments brought up to date.

Before industry is handed any future M-Day assignments by the military, potential suppliers are to be told what they are expected to produce, how much, and for whom.

To insure that this vital information gets to competent firms in time to be useful, Defense Dept. has newly revised its Production Allocation Program, operative since 1947.

The revision sets standards for including military items in the program and creates a priority system for planning output of critical products.

Advance Planning Required

Military supply items making up the advance-planning target for Pentagon officials are to be held to those that in wartime would be essential to survival and counterblows, to efficiency in battle, and to health maintenance. Supplies in these categories would meet one or more tests in a list of standards

They are to be items: (1) requiring long lead-time or a long manufacturing cycle, (2) not now in production or not being produced in quantities sufficient to meet wartime demands, (3) requiring conversion of an industry or of a number of plants within the industry, (4) involving materials or methods basically different from those currently used, (5) on which actual production experience is lacking, or (6) requiring large quantities of hard-to-get materials.

"All I know is it's a shipment of off-shore oil."

Established in the revised program is a preferential planning list of products on which advance blueprinting is considered mandatory. Classified as "confidential," the list includes items such as certain types of aircraft or weapons components that may cause production problems.

Items on this list are to be reviewed each year for further retention or for elimination.

The changed program puts greater responsibility on military department management officials, who must identify "problem" items and who are called upon for closer supervision of mobilization plans worked out with industry.

Formerly, the production allocation plan did not focus attention on those end-items or components which may be difficult to manufacture or construct. Quality of planning will be improved, the Pentagon believes, now that there is provision for concentrating time and effort on areas where results will be of maximum defense use.

Hook Named to Hoover Committee

Charles R. Hook, chairman of Armco Steel Corp., has been selected by the Hoover Commission to head up an overall committee on business organization of the Defense Dept.

Several task groups from the committee and also from the Defense Dept. itself are already studying various phases of the department's organization.

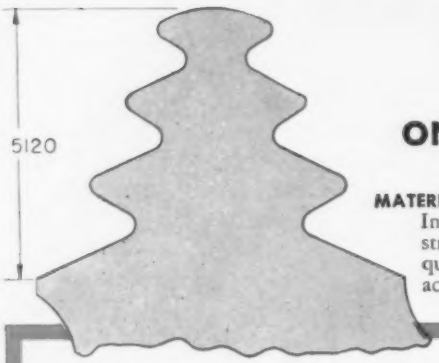
Besides Mr. Hook, Robert W. Wolcott, board chairman of Lukens Steel Co., Franz Schneider, executive vice-president of Newmont Mining Corp., and other businessmen will head the task forces and automatically become members of the overall committee.

FORM GRINDING

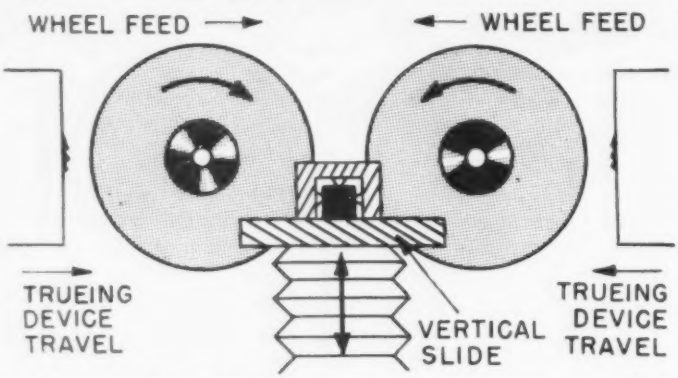
JET ENGINE BUCKET ROOTS

FROM THE SOLID!

ON J & L DUAL-WHEEL AUTOMATIC FORM GRINDERS



MATERIAL BORDERS ON UNMACHINABLE Intense heat and great centrifugal stresses on the pressure surfaces require the toughest material and most accurate finish.



Bucket is mounted on a reciprocating vertical slide for two-way grinding.

AUTOMATICITY SPEEDS PRODUCTION — MAINTAINS REPETITIVE ACCURACY — Operation is simplified to the push button stage by a completely automatic work cycle.

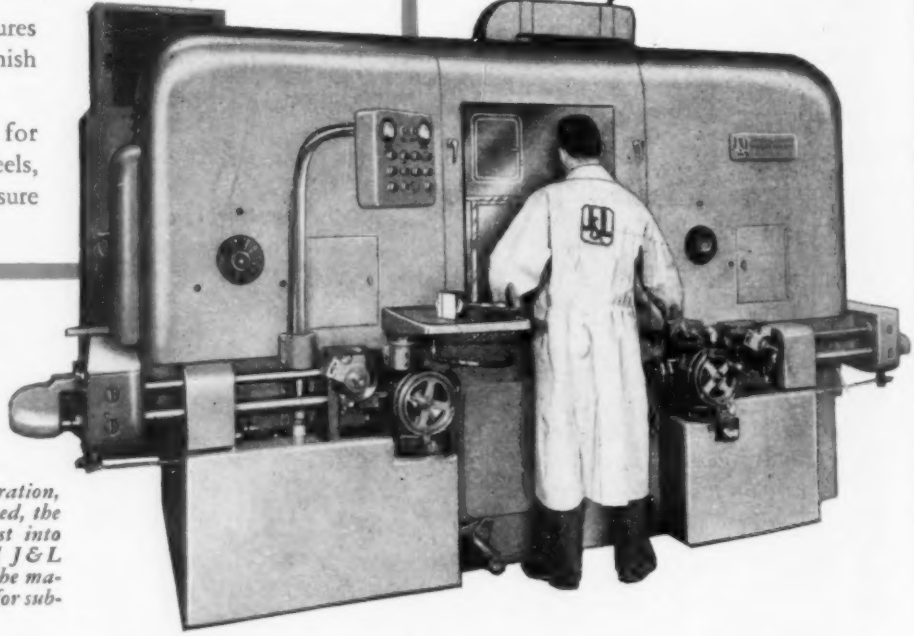
Automatic wheel trueing assures accuracy of form—includes finish trueing before final cut.

Automatic compensation for amount dressed off the wheels, and automatic wheel feed assure accurate sizing.

FEW MORE DIFFICULT GRINDING JOBS EXIST — Yet both sides of the root are ground simultaneously, to gage tolerances, on a production basis.

REPETITIVE ACCURACY MAINTAINED
Spacing of pressure surfaces within .0002
Taper within .0005
Angles within 10 minutes
Thickness from .0005 to .001

ACHIEVEMENT RESULT OF SEVERAL YEARS' RESEARCH AND EXPERIMENTATION — This application of the proven principles, long incorporated in J & L Thread Grinders, was initiated several years ago. The first machine was delivered in 1948. Continued study and subsequent refinements have helped lick one of the toughest machining problems of our day. Perhaps we can help you too.



P.S. *Before the grinding operation, the foil contour is checked, the blade oriented and cast into a matrix, on a special J & L Optical Comparator. The matrix serves as a fixture for subsequent operations.*

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., 511 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

THREAD GRINDER DIVISION

Navy Shipyards Cut Costs to Get Work

San Francisco yard has saved $792,000 on conversion of carrier with work only 13 pct completed . . . Job is a test case . . . Nodular iron forging progress—By T. M. Rohan.

West Coast Naval shipyards which traditionally have been last in line for major construction jobs are going all out for more business by showing that they can do it for less.

The San Francisco Naval shipyard last week had already cut costs $792,000 on the $67 million conversion of the carrier *Bon Homme Richard* with work about 13 pct completed. Over 22,000 manhours have been saved on the job which was admittedly given the yard as a test of its construction efficiency.

Engineers Confer . . . Capt. E. C. Holtzworth, repair superintendent, emphasized major savings have been due to close cooperation with the Bremerton, Wash., yard and eastern yards. Teams from the California yard have held repeated conferences with engineers from these yards.

Major saving was in stripping armor plates in 1100 mandays compared to 1700 for Bremerton and 3000 for New York. Gimmick that turned the trick was use of a railroad crane on special track in the drydock under the carrier's overhanging deck. This crane swung out plate as it was cut away, transferring it to high capacity overhead cranes for direct vertical lift to the top of the drydock.

In other yards, holes are cut in ship side plates and "strongbacks" and monorail hoists are used to jockey the plate out with block and tackle to where vertical crane lifts could be made.

Acetylene Piped In . . . Dismantling of furnishings was also accomplished in 3400 mandays compared to 10,400 for similar jobs elsewhere, and an acetylene piping system to welders throughout the ship's interior saved $170,000.

Availability of skilled workers which was thought poor due to widely varying work loads in the area since the heyday of wartime construction also was a surprise. More than 1700 are now working on the ship and 1300 more are expected to be assigned to the job this year.

Iron Forging . . . Progress in forging nodular iron and cutting micro-vibration in machine tools was described last week for 400 western industrial engineers in Berkeley, Calif., and Los Angeles this week.

In a speech prepared for the sixth annual Industrial Engineering Institute sponsored by the University of California, Max Kronenberg, Cincinnati consulting engineer, said the recently developed Schlege process conceived at Aachen, Germany, has succeeded in developing a method of forging ductile cast iron blanks into finished articles. Accuracy is materially improved so that machining operations can often be eliminated or substantially reduced.

"Hush-hush Navy job!"

Precast blanks of nodular iron with a tensile strength of 50,000 psi were increased to 145,000 psi. Parts can be forged to 480 Brinnell hardness.

Heating the blanks to 1500°F maximum was said to eliminate the radial flash which caused cracking of the cast iron when trying to press or forge it.

Mr. Kronenberg also said that machine tool vibration which is hardly perceptible now must be eliminated on future equipment, particularly for machining titanium and higher temperature alloys. In recent work at the R. K. LeBlond Machine Tool Co., Cincinnati, welded steel beds on engine lathes materially reduced "hardly perceptible" vibrations, he said. Vibratory strains at the bridge of the carrier were associated with noticeable noise and chatter marks when strain reached 40 micro inches per in.

This was established by connecting strain gages with oscillographs and amplifiers to the carriage and bed. With substitution of a special steel bed for standard cast iron bed, vibration range at limit intensity was narrowed from 60-180 cycles per sec to 90-120.

Titanium Progress . . . While military aircraft remains the No. 1 market for titanium, some progress is being made in civilian uses. Ward M. Minkler, West Coast sales manager for Titanium Metals Corp., told the San Francisco section of the American Welding Society last week that the primary civilian use is in nacelles for aircraft.

In addition it is being used on heat exchangers in chemical plants where its corrosion resisting qualities at high temperatures have extended life of these units considerably. Work on cladding stainless with titanium is progressing, he added.

New Tool Orders Up Slightly

December new order index hits 149.2 . . . Slight increase over November . . . May be first sign drive to increase replacements is paying off—*By E. J. Egan, Jr.*

The new order index for the machine tool industry showed a slight gain in December, not waiting for the new year to bring a predicted halt to the downtrend that had been more or less persistent since July, 1952.

Preliminary index for December is 149.2 as computed by the National Machine Tool Builders' Assn. This is a small but possibly significant rise from the November figure of 146.6, which was the lowest monthly index since pre-Korea.

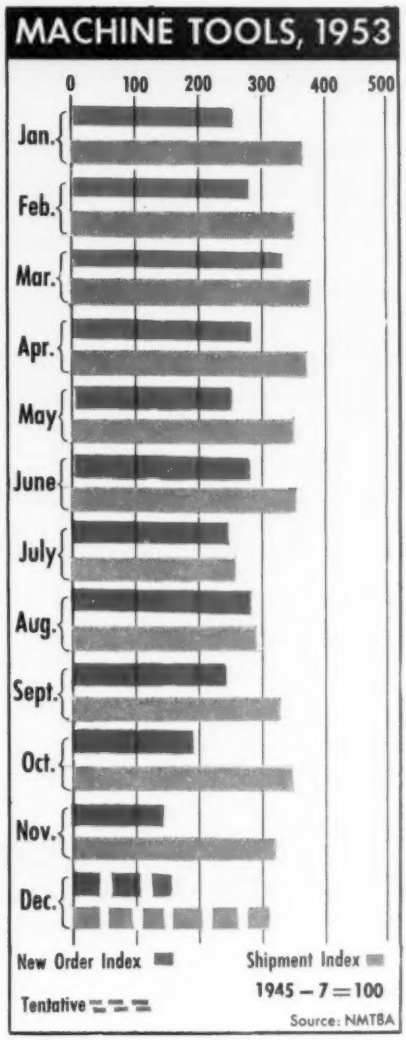
The December gain, if it is really the start of an upward trend in new machine tool business, could be significant. It could mean that constant pressure on the metalworking industry to replace obsolete equipment is beginning to pay off on a larger scale.

Pressure For Replacements . . . Metalworking manufacturers, up against tough, competitive, peacetime conditions, are well aware of the pressure to modernize. From within their own organizations, or their own industry, they can feel the effect of high labor and material costs. As machines wear to the point where they appear to waste material and manhours, the pressure to replace them is unavoidable.

Could be these forces sometimes become irresistible, especially in view of the incentives being pointed out to machine tool prospects these days. Among these are new and better equipment designs, a growing trend to machining at higher speeds and feeds, automatic, labor-saving devices, the promise of more realistic tax depreciation policies, and an apparent trend to tool leasing.

More Export Orders . . . The index of new machine tool orders from foreign customers rose in December also, to an estimated figure of 21.6 from the November mark of 16.9. This increase, though gratifying, is not as important to builders as the upswing in domestic business. Nor are foreign customers expected to set up a sudden clamor for American metalworking equipment.

U. S. builders will continue to shoot for big game wherever major tooling programs are in prospect overseas, but small orders for one or two units of general purpose equipment will probably be gobbled up by European builders without too much trouble.



Production Hits Low . . . The NMTBA preliminary shipment index for December is listed at 303.1, compared with 320.2 in November. Demonstrated production rate for the industry is estimated at 387.3 during December, a low point for the year 1953.

A matching low point is the 5.8 to 1 ratio of unfilled orders to demonstrated production rate, indicating a backlog of just under 6 months production. In September, 1951, this ratio had peaked at 23.5 to 1, due to pressure of defense requirements.

Builders would like to keep their backlogs at a healthy level, but not so high as to discourage customers by the prospect of a long wait for their equipment.

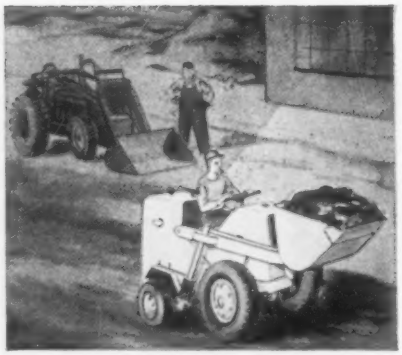
Will Do Better . . . In judging outlook for the industry this year, some builders state that makers of specialized metalworking equipment will probably fare better than firms producing general purpose machines.

Large tooling programs for mass production of stylized consumer items will continue to call for the latest in automated and transfer machine tools. Builders not closely identified with volume industries will have tougher going.

French industry sources are urging replacement of 150,000 obsolete machine tools in order to boost the nation's industrial output by 25 pct. Goal has been set as part of the country's second 4-year Equipment and Modernization Plan.

Fifty-three pct of French machine tools are estimated to be more than 20 years old, compared with an estimated 31 pct in Germany and 21 pct in the U. S.

You can't compete if your equipment is obsolete!



With business conditions more competitive, it is more important than ever to analyze your production costs . . . your handling methods . . . your tools and equipment.

Obsolete methods and equipment take a heavy toll by slowing down production, increasing manhours and increasing repairs and maintenance. Material handling equipment in many plants is the key factor in efficient production — the pace setter for the entire plant. That is why it is so important to keep raw materials *on the move* in and out of the plant, to and from processing machinery — with the most modern, efficient methods and equipment.

If you are not using "PAYLOADER" Tractor-Shovels at present, it will pay you to investigate this fast, flexible, versatile system that is producing outstanding economies in all sizes of plants throughout the nation.

If your plant is already "PAYLOADER"-equipped, you'll be pleasantly surprised at the superior performance of the late model "PAYLOADERS". Although "PAYLOADERS" are built for years and years of dependable service, constant research and engineering improvements keep "PAYLOADERS" out in front in design, construction and performance.

Now is the time to trade in obsolete equipment — to gear your plant to present day conditions — to assure profitable operation on existing or slightly lower sales volume. Your nearby "PAYLOADER" Distributor will be glad to discuss your material handling methods and provide a demonstration of this equipment. For his name and address write The Frank G. Hough Co., 733 Sunnyside Avenue, Libertyville, Illinois.

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REPORT TO MANAGEMENT . .

Ike on a tightrope

Administration policy as roughed out in the President's various messages to Congress has been tagged by extremists as being both "New Dealish" and "a Big Business handout."

Actually Mr. Eisenhower has done a neat job of tightroping his way to a program that as far as possible will please most of the people most of the time and still help the economy.

What's in it for you?

For you as a businessman the Administration's proposals are soundly slanted to prevent adjustment from pellmelling into recession. Your main benefits are: (1) a better break on depreciation tax policy, (2) proposed end of double taxation of corporation earnings.

The latter is figured to give stockholders more money to back company expansions.

Excise cut coming

Business and industry expressed some disappointment over the President's request for cancellation of the scheduled drop in corporation tax rates and excise taxes. But this has been quieted somewhat by indications that election-minded Congress may compromise by putting through a 50 pct reduction of excise taxes on most "luxury" items.

This will help sales in the industries specifically affected, will give consumers a few more dollars to spend.

Prosperity plan ripples

Some spot reactions to the Administration's prosperity play: Machine tool builders say orders are running 10-25 pct above the November-December ebb. Tool buyers are certain the President's depreciation tax proposal will be approved by Congress retroactive to Jan. 1 and are firming orders they had been holding back.

And the stock market, previously buoyed by GM's billion-dollar-plus expansion plan, last week soared to its highest point since the record levels of April '53. Wall Street says this is a reaction to Administration moves to prevent recession.

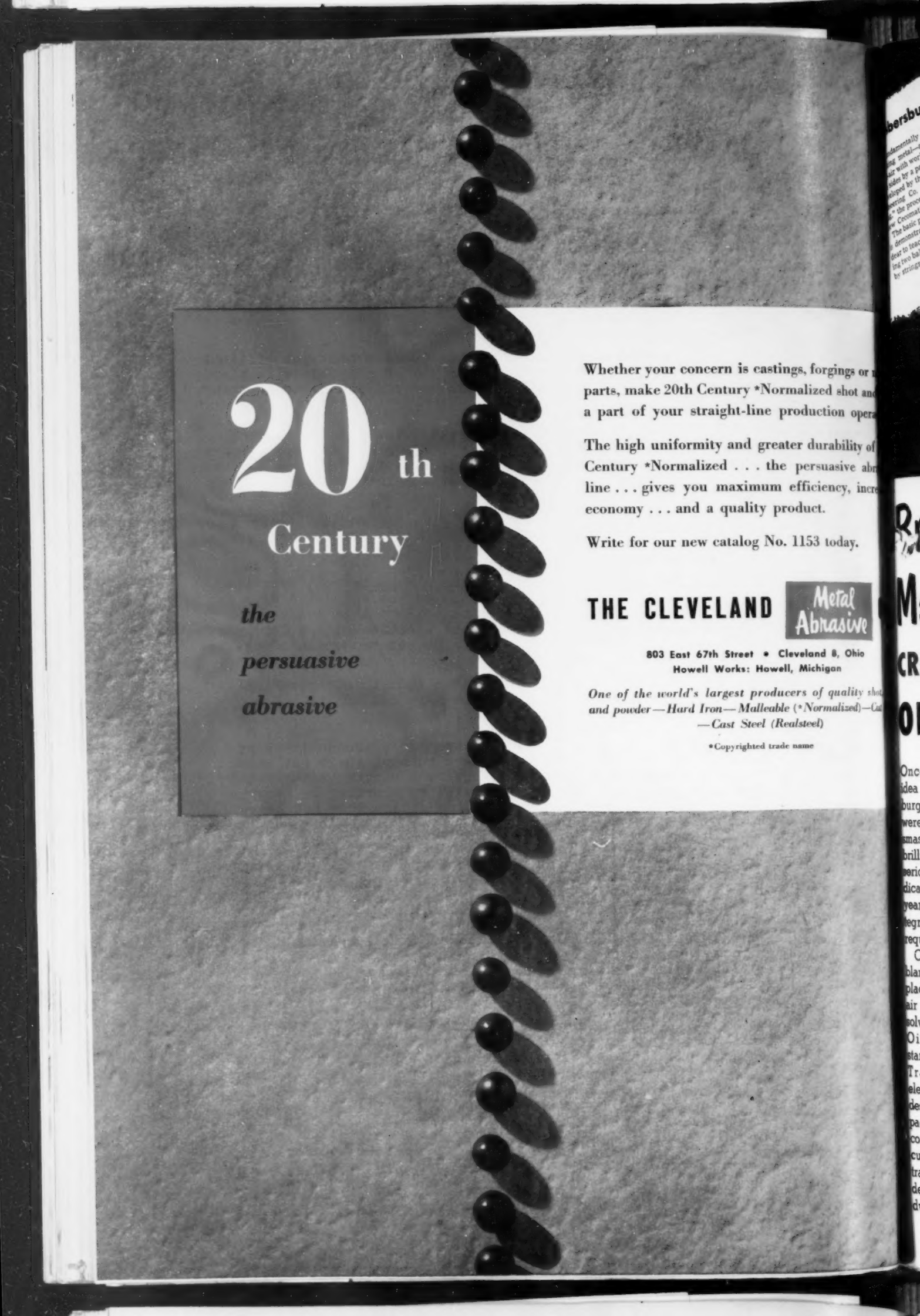
Steel's not dead

Steel industry expenditures for modernization and expansion this year may surprise you. Companies estimate they'll spend $775 million; actual total may be considerably more. This means a good chunk of business for construction people--especially mill equipment suppliers.

Estimated expenditures this year are slightly higher than the postwar average. This will come as quite a surprise to people who assumed steel's expansion cycle was completed when they heard that 1954 capacity is rated at 124.3 million tons.

How much do you make?

If you're a sales executive and made between $10,000 and $14,000 you have a lot of company. Survey by Sales Executive Club of New York shows largest group of its members (25.7 pct) were in that salary bracket. Average income for the group was $22,286.


20th
Century
the
persuasive
abrasive
Whether your concern is castings, forgings or
parts, make 20th Century *Normalized shot an
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The high uniformity and greater durability of
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and powder—Hard Iron—Malleable (*Normalized)—Ca
—Cast Steel (Realsteel)
*Copyrighted trade name

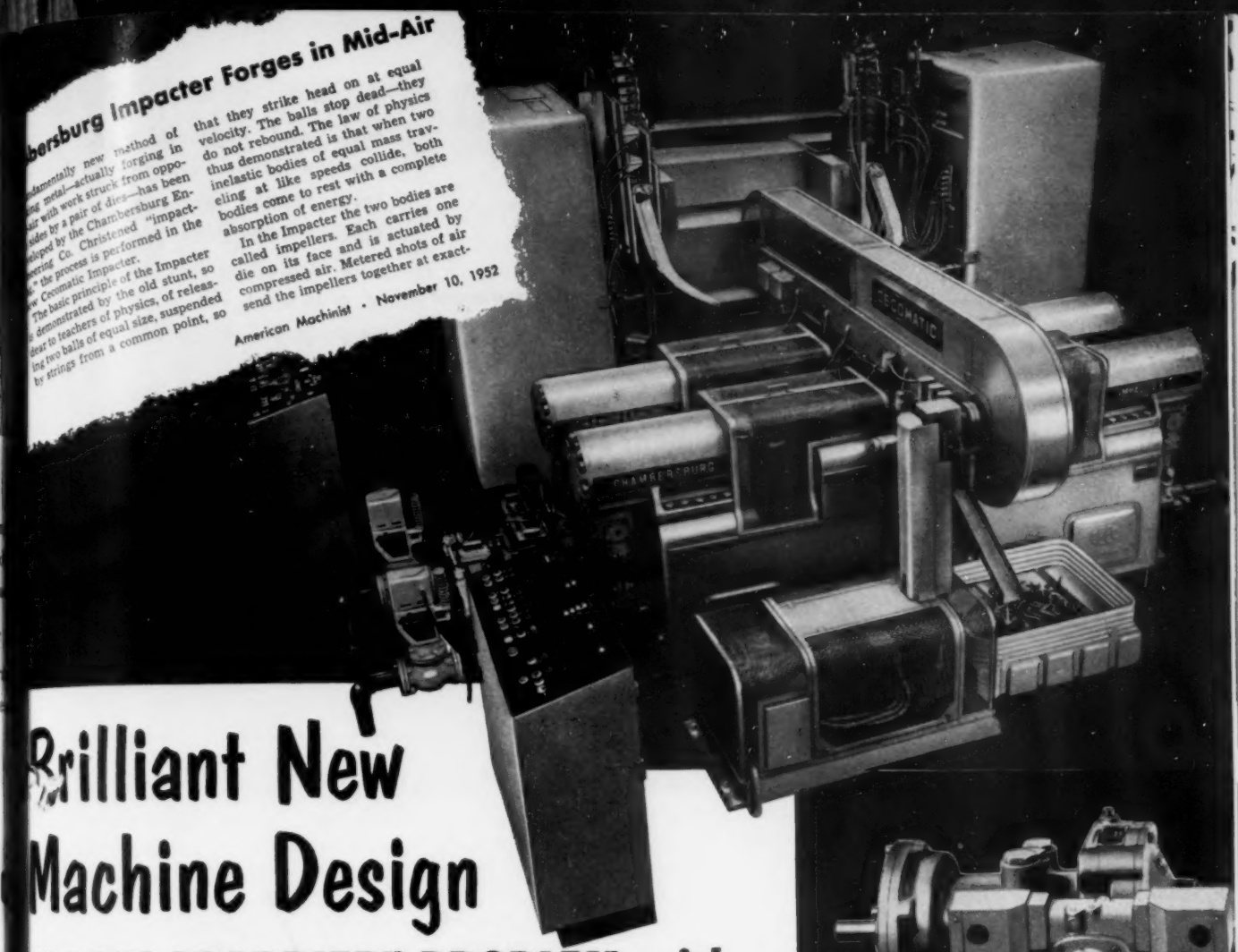
bersburg Impacter Forges in Mid-Air

damentally new method of ing metal—actually forging in air with work struck from oppo- sides by a pair of dies—has been eloped by the Chambersburg En- neering Co. Christened "impact- ," the process is performed in the w Cecomatic Impacter.

The basic principle of the Impacter demonstrated by the old stunt, so dear to teachers of physics, of releas- ing two balls of equal size, suspended by strings from a common point, so that they strike head on at equal velocity. The balls stop dead—they do not rebound. The law of physics thus demonstrated is that when two inelastic bodies of equal mass trav- eling at like speeds collide, both bodies come to rest with a complete absorption of energy.

In the Impacter the two bodies are called impellers. Each carries one die on its face and is actuated by compressed air. Metered shots of air send the impellers together at exact-

American Machinist · November 10, 1952



Brilliant New Machine Design

CRACKS "BARRIER" PROBLEM with OILGEAR FLUID POWER

Once the "forge-it-in-mid-air" idea occurred to the Chambersburg Engineering people, there were two "barrier" problems to be smashed before the idea became a brilliant reality. Something of the seriousness of the problems is indicated by the fact they spent 10 years to get the right, precise integration of movements and forces required.

One problem, that of getting the blanks to be forged into the right place at the right time for the mid-air forging blow, was eventually solved by recourse to *Any*-Speed Oilgear Fluid Power. The standard totally enclosed Oilgear Transmission with integral electro-hydraulic control gave the designers of the Cecomatic Impacter remote, interlocked, precise control of the conveyor . . . quick, cushioned acceleration . . . high traverse speed . . . fast, cushioned deceleration . . . smooth stop and dwell in forging position; all at the speed and accuracy they needed . . . just as so often in the past Oilgear has given *other* machine designers what *they* wanted.

Maybe your problem can be solved, your machine's performance improved by the smooth, swift acceleration and deceleration of the *Any*-Speed Oilgear. Maybe you need its extreme precision of controllability . . . or any of a dozen other remarkable characteristics. In addition you get simplicity, ease of assembly into your machine, ruggedness, dependability, accessibility, a unique freedom from maintenance.

But whatever your need, *you have not exhausted all possibilities in machine design if you have not investigated Oilgear Fluid Power Pumps, Motors and Transmissions exhaustively.* You too may have a world beater in your hands. THE OILGEAR COMPANY, 1581 W. Pierce St., Milwaukee 4, Wis.

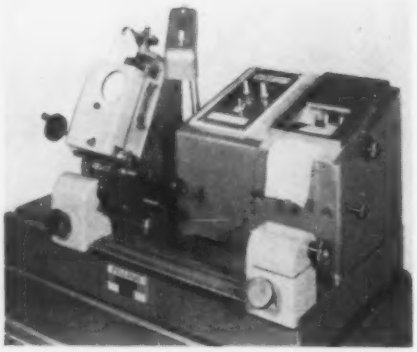
Cecomatic Impacter doubles, triples, quadruples—octuples forging production! No jar or vibration. Less metal stress and die wear. Blanks load into conveyor automatically. And automatically the Oilgear type AXB-33 Variable Speed Transmission accelerates conveyor swiftly, smoothly, it smoothly stops with forging blank "dead on target," waits for the forging blow, then accelerates forged part away and new blank into position. Oilgear is adjustable up to 40 cycles per minute, is easily set to any required index distance which is then maintained under complete automatic control with unvarying precision.

OILGEAR

OILGEAR

NEW EQUIPMENT

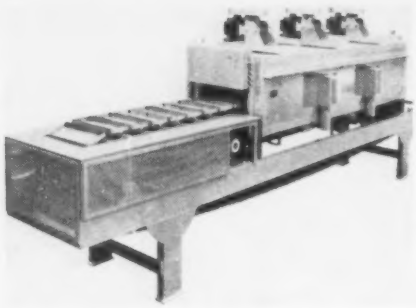
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 115 or 116.



Instrument checks fine-pitch gears

A new Red Liner with several refinements for the checking of fine-pitch gears provides the type of measurement designated by the A. G. M. A. as a composite check by which all gear errors are measured in combination. The instrument operates on the principle that errors in gear tooth elements cause changes in velocity or in center distance. The master gear is mounted on an arbor in a movable spring-loaded carrier. It is meshed with the work that is located in fixed holder or centers. As master and work rotate in intimate contact, any variation in center distance is measured and recorded on a moving paper chart. *Fellows Gear Shaper Co.*

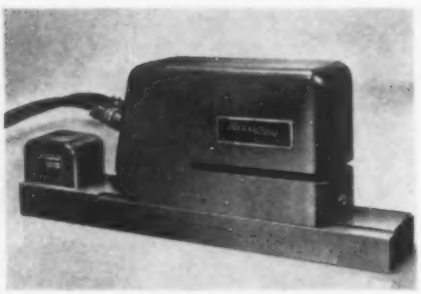
For more data circle No. 16 on postcard, p. 115.



Continuous production with a conveyor furnace

This conveyor furnace has been designed for the specific job of heating aluminum and brass billets prior to forging. Additional features built into the furnace make it possible to use it for tempering, annealing, stress relieving, or doing other heating operations requiring a maximum temperature of 1650°F. Elements are of nickel chromium wire wound through ceramic refractories. Three fans speed the heating of the materials by circulating the heated air, assuring the even and uniform temperature in the heating chamber. *Hevi Duty Electric Co.*

For more data circle No. 17 on postcard, p. 115.



Radiation gage for small rolling mills

Designed to measure the thickness of strip on small, compact cold reduction mills, a new model AccuRay radiation gage has been introduced to the steel industry. A measurement range of 0.00005 to 0.060 in. is provided by the model. It is streamlined for close-quarter mounting, measuring 10½ in. high x 4½ in. wide x 26 in. long. It is positioned by a lead screw mechanism which enables it to traverse strip up to 6 in. wide. A unique automatic standardization cycle enables the gage to compensate for error-producing variables. *Industrial Nucleonics Corp.*

For more data circle No. 18 on postcard, p. 115.

Wide selection of speeds in drilling and tapping

Production increases of 25 pct are claimed for this new variable speed drilling and tapping machine, designed and built under actual tool room and customer shop conditions. Infinitely variable speed drive allows the operator to select correct speeds instantly with no lost production time for changing gears or belts. And quick selection of correct speeds in a broad range, contributes to maximum tool life and increased production. Speed changes are made instantly with a handle controlled mechanism conveniently located for the operator. An indicating dial shows the speed selected. Spindle speeds range from 200 to 3600 rpm. Capacity of the machine with back gears is ⅞ in. for steel, 1¼ in. for cast iron. Models with 8 in. and 15 in. overhang and from 1 to 8 spindles are available. *Edlund Machinery Co.*

For more data circle No. 19 on postcard, p. 115.

Turn Page

LATEST INFORMATION ON PROVEN METHODS FOR TREATING *CHROMIUM WASTE LIQUORS!*

A "Must" for...

Plant Engineers and Operating Men... with chromium waste disposal problems.

General Chemical's new booklet provides *sound, practical* information on the use of Anhydrous Sodium Bisulfite. For example, it contains data on:

- Properties and characteristics of Anhydrous Sodium Bisulfite
- When and how to use Batch and Continuous treatments
- Flow diagrams for chromium waste treatment plants
- Materials of construction for waste treatment plants
- Latest testing methods

If you do Chromium Plating-Anodize Aluminum-Clean Brass, etc. You Need this Booklet!

General Chemical has long been one of America's foremost producers of Anhydrous Sodium Bisulfite, with a broad and thorough knowledge of the product, its properties and uses. As such, the company has assisted many organizations in the planning of their chromium waste treatment installations using Anhydrous Sodium Bisulfite. Much useful information based on this experience has been incorporated in a new booklet now available to plant engineers and operating men who have chromium waste disposal problems. It will prove a useful guide in setting up disposal plants using Anhydrous Sodium Bisulfite.

For those who wish to explore the problem more thoroughly, the services of General Chemical's Technical Service staff are available without cost or obligation. These experts are ready to assist plant operators in overcoming difficulties with the treatment of chromium wastes from plating, aluminum anodizing and brass-cleaning operations. Possibly they can help you with your disposal problems in the same practical way they have served so many other companies.

For Technical Service—or for further information on Anhydrous Sodium Bisulfite—write or phone the General Chemical office nearest you.

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Gentlemen: Please send me AT NO COST OR OBLIGATION your free booklet "Treatment of Chromium Waste Liquors with Anhydrous Sodium Bisulfite."

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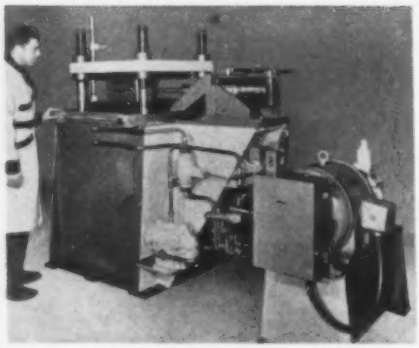
Air turbine grinder is cost and time saver

The new Lorantco hand air turbine grinder and miller comes in three sizes to perform grinding, milling and polishing operations at speeds to 85,000, 70,000 and 55,000 rpm. Its light weight, power and compact well balanced design make handling easy, work accurate. The air driven turbine provides a wide range of spindle speeds designed for use with tungsten carbide and high speed steel burrs, precision grinding points, abrasive and diamond impregnated wheels. Speeds are selected by a twist grip knob. Tools operate on 60 to 100 psi air pressure. *Newage International, Inc.*

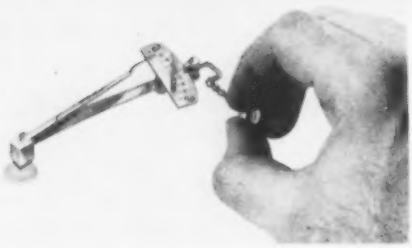
For more data circle No. 20 on postcard, p. 115.



Inverted presses provide low cost versatility

New line of inverted vertical hydraulic presses are adaptable to a wide variety of stamping and extrusion operations. They have their hydraulic control cylinder in the base of the machine, a design feature that reduces overall height, avoids shut height limitations, lowers center of gravity and provides areas at the top and sides for the mounting of auxiliary hydraulic cylinders. The 175-ton press shown performs bending and extrusion operations on ferrous and nonferrous parts, as well as upsetting, drawing and coining operations. The hydraulic power pack unit provides press operating pressures. *Walter P. Hill, Inc.*

For more data circle No. 21 on postcard, p. 115.



Inch-gram torque wrench for electronics field

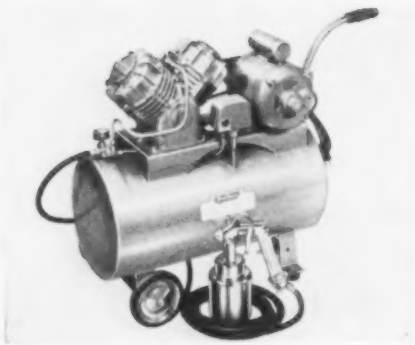
This smallest of torque wrenches, 0 to 80 inch-gram range, can be made only because it is possible for the operator to concentrate the load position by means of a pivoted handle. Simplicity of design of this sturdy little torque wrench means that it may be handled as any ordinary small tool, and yet is guaranteed to remain permanently accurate over its entire life. Widely spaced increment markings on the scale are in steps of 5 in.-g. *P. A. Sturtevant Co.*

For more data circle No. 22 on postcard, p. 115.

Air-electric gage measures highly polished part

Through a combination of air gaging and electrical signalling two OD's of a highly polished bearing are measured simultaneously by a new air-electric gage. The measurements are taken with a dual air snap and then transferred through an air-electric switch to the Electricator unit. This unit, in turn, operates a set of tolerance lights. If both dimensions are good, the green light flashes; if either diameter is undersize the amber light alerts the operator, while a red light indicates oversize. A glance at the large Dimensionair dials will tell the operator which dimension is off and how much. Air was chosen as the measuring method for great accuracy and the bearing cannot be marred. *Federal Products Corp.*

For more data circle No. 23 on postcard, p. 115.



Tank sprayer combines convenience and power

Portable tank sprayer for light industrial use features easy mobility plus extra power provided by a twin compressor. The compressor is the multiple diaphragm type and equipped with oversize lubricated-for-life ball bearings. Its 11½-gal, heavy welded steel air-storage tank has an automatic pressure switch—starts motor when pressure drops to 30 lb; shuts off when pressure reaches 45 lb. Twin compressors deliver 4 cu ft of air per min. Complete unit is mounted on rubber-tired wheels that are removable for stationary use. It is equipped with a tire inflated chuck, spray gun and ½ hp motor. *W. R. Brown Corp.*

For more data circle No. 24 on postcard, p. 115.
Turn to Page 126

NOW...you can rent new Kearney & Trecker machine tools!

Here's what that means to you—

TOOL-LEASE ALLOWS YOU TO—

- ✓expand production without tying up working capital
- ✓stay free of long term investments
- ✓remain debt free
- ✓avoid the risk of high obsolescence
- ✓be unrestricted by creditor's limitations
- ✓keep future borrowing capacity unimpaired
- ✓simplify your financial structure
- ✓obtain optimum efficiency, flexibility and capacity to meet constantly changing production requirements.
- ✓try out, in effect, new machines... without having to buy them

TOOL-LEASE HELPS YOU GET THE EXACT TOOLS FOR THE JOB—

Under Kearney & Trecker's Tool-Lease Program, you may obtain any standard Kearney & Trecker machine tool. This includes: standard knee-type and bed-type milling machines and precision boring machines. Special lease agreements will be considered where either special machinery or applications of heavy-duty CSM bed-types are required.

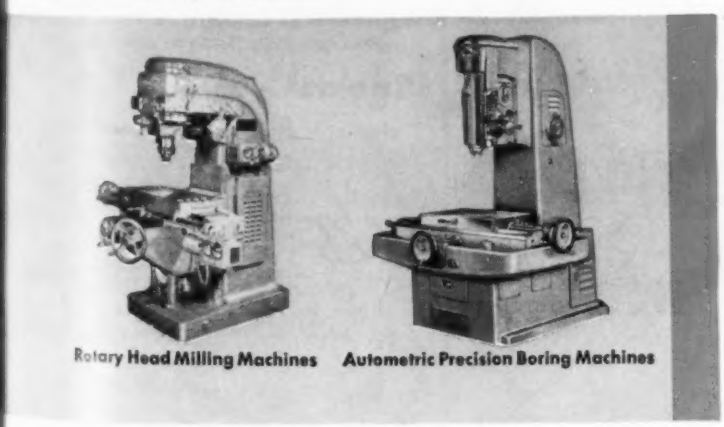
TOOL-LEASE GIVES YOU 3 PLANS TO CHOOSE FROM—

The basic Tool-Lease Program gives you a choice of three plans with varying options to terminate the lease, continue the lease or purchase the equipment. Depending upon the plan selected, equipment may be leased for one, two or three or more years.

Your Kearney & Trecker representative will be pleased to give you specific Tool-Lease information and help you analyze your machine tool needs... suggest the equipment that will best help you solve your production problems. Write, wire or phone Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

TOOL LEASE
KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS
EQUIPMENT ®

Fill out and attach coupon to your letterhead and mail for Tool-Lease Bulletin.



Rotary Head Milling Machines — Autometric Precision Boring Machines

Kearney & Trecker Corporation
6784 W. National Ave.
Milwaukee 14, Wis.

Please send me Bulletin TL-10A with details on the Tool-Lease Program.
☐ Check here if you would like to have a representative call on you as soon as possible (or call Milwaukee, GReenfield 6-8300).

Name.....

Title.....

Company.....

Address.....

City.....Zone.....State.....

—New Equipment—

Continued

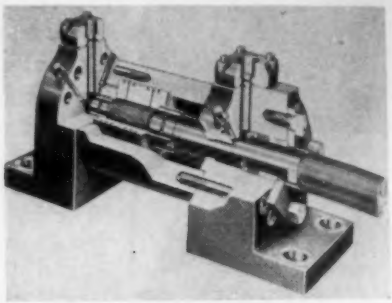
Electronic controllers

Automatic testing program controllers have been developed for automatic production and quality control testing as well as research programs. Controllers are designed for production testing, proof testing, yield strength by the extension under load method, stress cycling (load), strain (unit deformation) cycling and crosshead cycling. Units are available for any one or any combination of these automatic testing controls. *Tinius Olsen Testing Machine Co.*

For more data circle No. 25 on postcard, p. 115.

Hydraulic cylinders

Over 800 basic models comprise a new H-P-M hydraulic cylinder line. A wide range of standard mountings are available such as foot, side lug, centerline, clevis, base, flange, rabbet, trunnion and sub-plate. Adjustable stroke cylinders are also available with foot or centerline



mountings. Features of the line include heavy duty construction with generous safety factors, spring-loaded piston rod packings for positive sealing, and mounting design making them interchangeable for reuse of equipment. End covers are solid steel, accurately machined for perfect alignment of piston and rod. Bore sizes range from 1½ to 12 in. *Hydraulic Press Mfg. Co.*

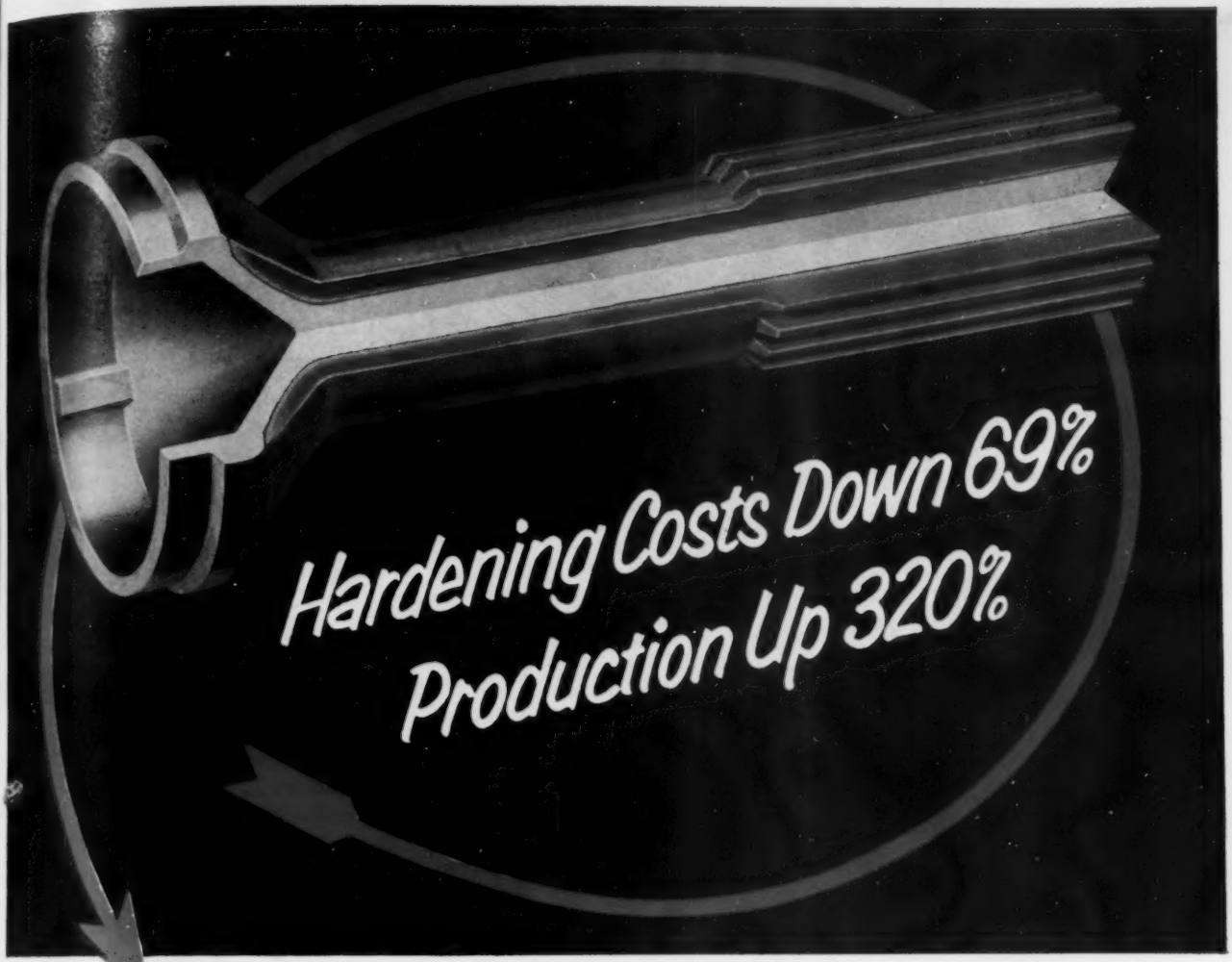
For more data circle No. 26 on postcard, p. 115.

Coolant valve

Automatic hydraulic coolant valve for grinding machines automatically turns the coolant to the diamond wheel dressing tool, on and off at each dressing cycle. Shattered diamond due to operator's negligence in turning on the coolant is no longer possible. *Cleveland Industrial Tool Co., Inc.*

For more data circle No. 27 on postcard, p. 115.

Turn Page



with TOCCO* Induction Heating

Hardening—annealing—brazing—soldering—heating for forming or forging—if your products require any of these operations TOCCO can probably reduce your unit costs too.

COSTS DOWN 69%— Mechanics Universal Joint Division of Borg-Warner reports a 69% savings in the hardening of stub ends for propeller shafts. TOCCO'S localized hardening minimizes distortion—does away with straightening operation formerly required. With conventional heating methods splines had to be ground back to tolerance because of run-out. TOCCO also eliminates this costly operation.

PRODUCTION UP 320%— Automatic TOCCO has upped production from 35 to 112 parts per hour—over three times as fast as conventional heating method. Shafts are of C-1137 Steel, are hardened to 47—54 R.C. to a depth of 0.040". Every part is the same—one or a million—because TOCCO'S automatic heating and quenching cycles eliminate all chance for human error.

Experienced TOCCO engineers are glad to survey your plant for similar cost-cutting possibilities—no obligation of course.

THE OHIO CRANKSHAFT COMPANY

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-2, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening.

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

Tool holder

Rapid setups with extreme accuracy are claimed for the new BA-10 tool holder with adjustable V-jaws that eliminate need for bushings or other holding accessories. Any diameter tool from 1/64 to 5/16 in. may be held by

simply slipping the tool in V-jaw and tightening clamp screws. Smaller physical outline of the holder leaves more space for larger tools; provides less interference with slide tools. Lightweight makes for less inertia and axially true design makes perfect tool alignment an automatic certainty. Designed for No. 00 B & S machines. *Brookfield, Inc.*

For more data circle No. 28 on postcard, p. 116.

Bar stock rack

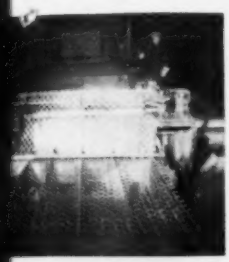
Portable bar stock rack is said to make it easy for one man with hoist to pick up and stack heavy, unwieldy bar stock, tubing and miscellaneous structural shapes, neat-

ly and safely. Faster stock selection, and easier, more accurate inventory control is also claimed for the rack. The rack is heavy duty structural steel construction. *Jarke Mfg. Co.*

For more data circle No. 29 on postcard, p. 116.
Turn Page

CONTINENTAL Proved Fence Features Cost No More Than Ordinary Fence

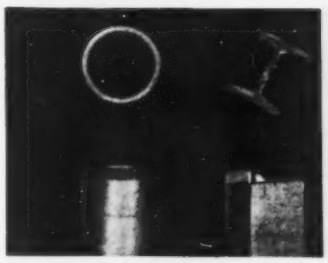
"HOT-DIP" GALVANIZED THROUGHOUT



Full gage, high-tensile strength Continental Fence wire is woven into exact mesh, then completely immersed in a temperature controlled bath of molten zinc . . . for a tough, rust-resistant armor coat. Fabric withstands temperature changes . . . retains tension and perfect alignment.

● H-SECTION LINE POSTS 15% HEAVIER

H-section line posts of special analysis copper-bearing steel provides a post twice as resistant to bending at right angles to fence line, where most damage occurs. Tubular corner posts, often exposed to trucks, heavy equipment, furnish maximum resistance in every direction.

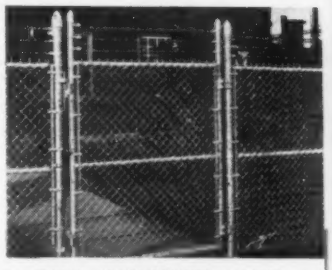


MORE POST AND TOP RAIL TIES

Extra No. 6 gage all-aluminum ties securely hold fabric to fence framework. Special bevel-edge tension band and locking pin eliminates ordinary nuts and bolts for preventing rust. Fittings attached to posts and rails without drilled holes, to maintain maximum structural strength.

● EASIER OPERATING, ALL-WELDED GATES

Stronger, neat-appearing construction, with improved pivot-type hinges. Securely braced slide, swing and cantilever gates available. All gates equipped with positive-locking devices suitable for padlocking. Counter-balanced gate-keepers automatically hold gates open.

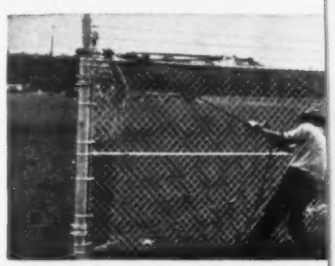


HEAVIER POST CAPS AND ARMS

Heavily ribbed malleable iron, bullet-shaped caps provide deeper capping for a moisture-proof seal. Combination malleable iron and 12 gage pressed-steel self-locking barb arms are heaviest, strongest obtainable.

● ENGINEERED AND ERECTED FOR LONGER LIFE*

Continental Fence Engineers help plan and lay out your installation. Line posts are securely set in solid concrete. Tough brace bands, rods and trusses hold Continental Fence in perfect alignment for extra years of worry-free property protection.



You'll Be Glad You Talked With Continental

* TRADE MARK REG. U.S. PAT. OFF.

CONTINENTAL STEEL

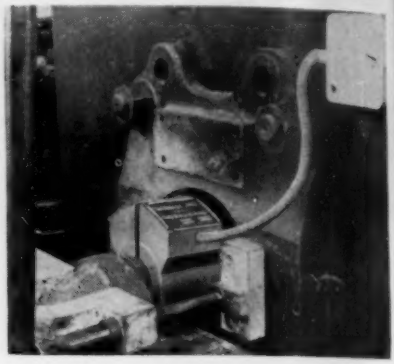
CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Nozzle heater

Nozzle problems confronting diecasting manufacturers can be solved through the application of a Thermaband nozzle electric heater that gives close temperature control. The heater is built to exact physical dimensions of the nozzle and cor-



rect thermal loads governed by the total pound per hour of output desired. Such installation is found to eliminate freezing of diecasting material in the nozzle at the end of the casting cycle; eliminate uncontrolled nozzle warping; reduce tendency of the nozzle heater to overheat the die. *Thermel, Inc.*

For more data circle No. 30 on postcard, p. 115.

Productivity recorder

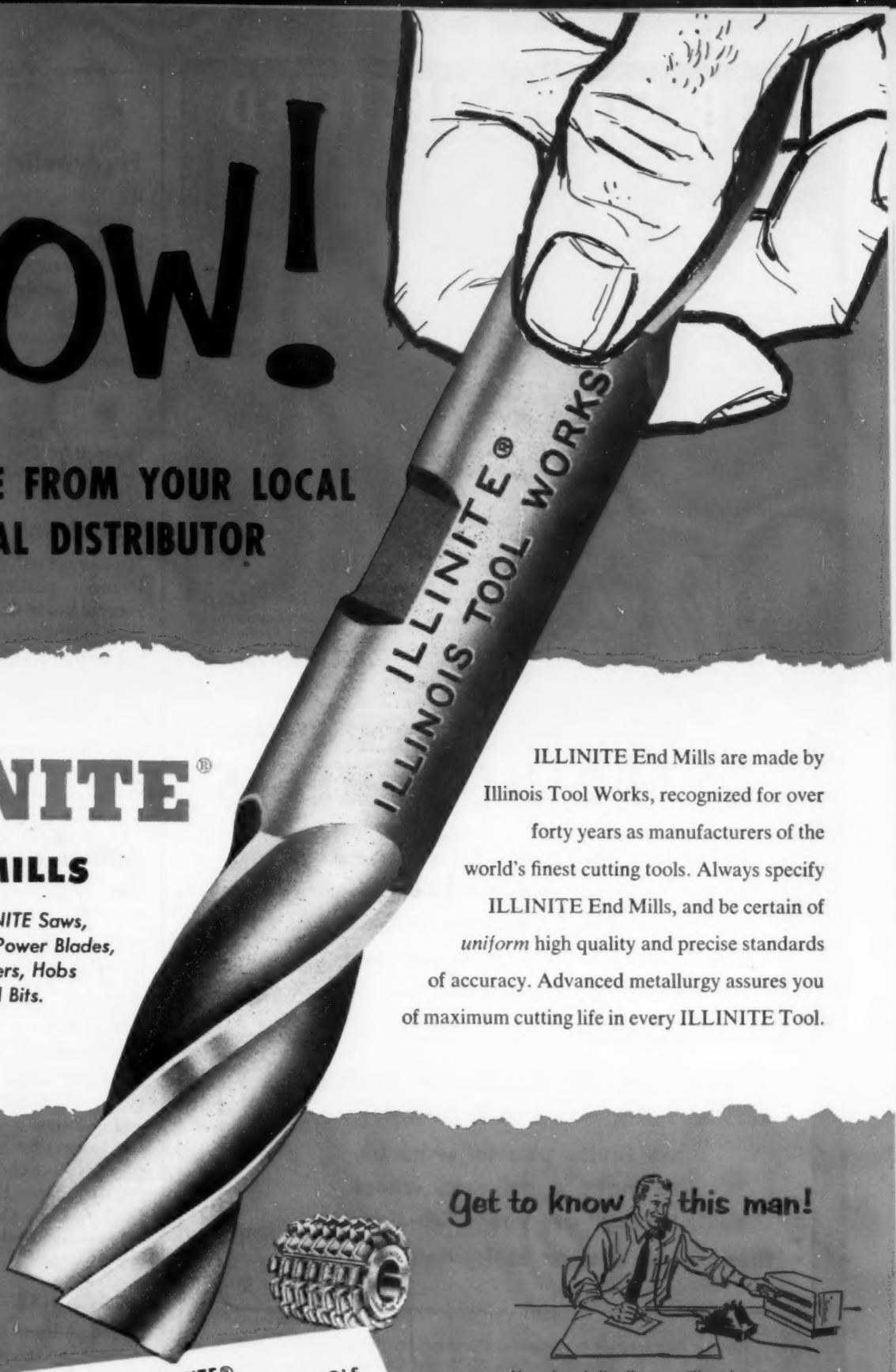
New Servis recorder electrically shows productive and idle time of plant machinery. It is valuable in time studies to set rates, or as a check on the exactness of processing operations. Because it requires only a wire connection to the machine's motor it can be lo-

cated anywhere, and recording can be seen as the machine operates. Six-inch diam, 24-hr chart revolves three times, making a total record of 3 days and 3 nights on a single chart. Twelve and 8-hr charts are available. *Service Recorder Co.*

For more data circle No. 31 on postcard, p. 115.

Now!

AVAILABLE FROM YOUR LOCAL INDUSTRIAL DISTRIBUTOR



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END MILLS

. . . and ILLINITE Saws, Milling Cutters, Power Blades, Shaper Cutters, Hobs and Tool Bits.

ILLINITE End Mills are made by Illinois Tool Works, recognized for over forty years as manufacturers of the world's finest cutting tools. Always specify ILLINITE End Mills, and be certain of *uniform* high quality and precise standards of accuracy. Advanced metallurgy assures you of maximum cutting life in every ILLINITE Tool.

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Your local distributor will make prompt deliveries of ILLINITE Standard Cutting Tools, from stock. Depend on him—and on ILLINITE Tools—to meet your cutting tool requirements.

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2501 N. Keeler Avenue, Chicago 39, Illinois

—Free Publications—

Continued

Hydraulic components

Hydraulic Press Mfg. Co.'s new catalog gives complete engineering data on over 800 basic models of hydraulic cylinders, valves, pumps, motors, power units and accessories. Adjustable stroke cylinders are available with foot or centerline mountings. Cylinders are available with male or female, single or double end piston rods, with or without cushion. *Hydraulic Press Mfg. Co.*

For free copy circle No. 12 on postcard, p. 115.

Yearbook

Minneapolis-Moline Co. has announced publication of its 1954 yearbook which is a 28-p. combination calendar-catalog. It features the entire line of farm equipment manufactured by company. Yearbook has been used to announce the term *Uni-farmor* to designate a new group of company farm machines. *Minneapolis-Moline Co.*

For free copy circle No. 13 on postcard, p. 115.

Silicon carbide

New 52-p. brochure discloses the properties of silicon carbide as related to various applications and outlines manufacturing techniques. Since its discovery, silicon carbide has been generally known for its widespread use as an abrasive. In addition to its abrasive applications, however, silicon carbide also possesses some unusual physical and chemical properties and is finding increasing use in the manufacture of a number of other completely different types of products. *Carborundum Co.*

For free copy circle No. 14 on postcard, p. 115.

Stock list

Rolled Alloys, Inc. has released a monthly warehouse stock list giving inventory of sheets, plates, rounds, squares, hexagons, flats, nuts, pipe and welding rods. For aircraft sheet metal, company is now stocking cold rolled and hot rolled sheets from .040 to .140 in AMS-5521-A specification. *Rolled Alloys, Inc.*

For free copy circle No. 15 on postcard, p. 115.

The Iron Age

SALUTES

Joseph R. Carter

This rising young steel executive likes to do things on his own, the hard way if necessary.

SOME people might say that Joe Carter does things the hard way. And they would be right, too—in a way.

Joe is vice-president—operations for Johnson Steel & Wire Co., Worcester, Mass., a subsidiary of Pittsburgh Steel Co. As such, he's directly responsible for a half-million-dollar modernization program that will be completed next July.

Easiest way to do the job would have been to call in outside experts and let them take over. Joe does have outside suppliers and contractors, naturally, but he and his men are doing a good bit of the work themselves. Result: The 7-point program is costing a lot less—30 to 50 pct less on some equipment—and it is being paid for out of profits.

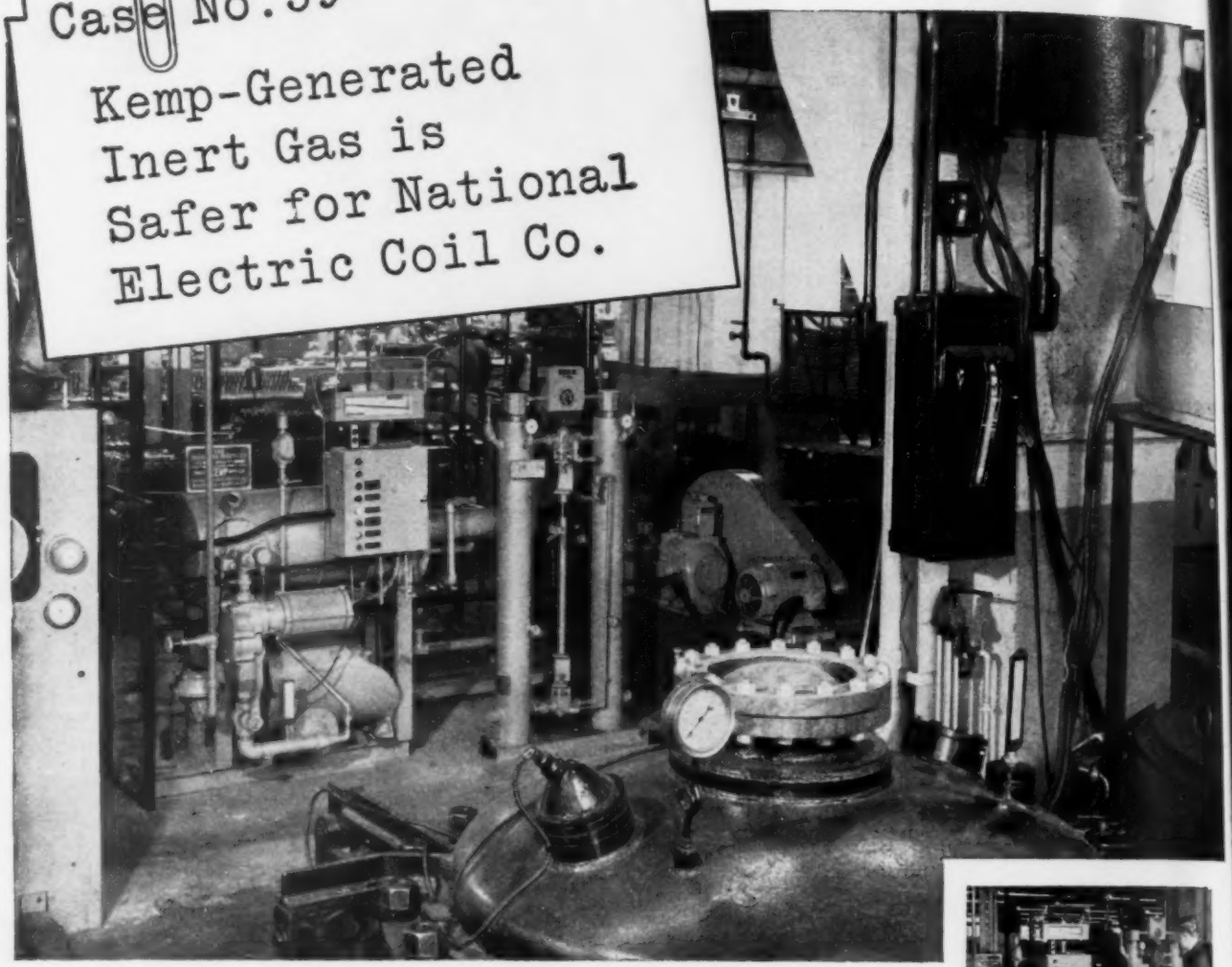
Joe Carter could have taken the easy way in another direction, too—had he wanted. His father is Joseph H. Carter, recently-retired chairman of Pittsburgh Steel Co. Many another young man would have gone along on the old man's coattails. But Joe's history reads otherwise.

While going to Penn State, Joe worked three summers at Sharon Steel Corp. in the openhearth shop, blast furnaces, and rolling mills. After graduation he was a second helper on the openhearth and, later, first helper on an electric furnace. After a stint as night superintendent at Sharon's Lowellville plant, he went into the Navy for four years during World War II.

Joe joined Johnson Steel & Wire in 1947 as assistant works manager. A year later he was made assistant general manager, and a year after that was appointed vice-president—operations. Father of three, Joe is an ardent bowler, still skis despite a broken leg suffered in his initial effort. He's also a high fidelity fan.

Case No. 59

Kemp-Generated Inert Gas is Safer for National Electric Coil Co.



How National eliminates danger of explosion . . . cheaply and conveniently

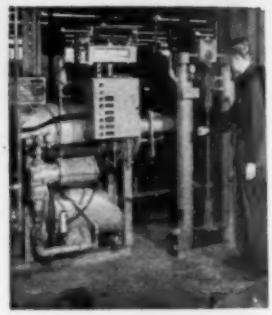
National Electric Coil Co., Columbus, Ohio, impregnates electric coils and windings by forcing in a hot sealing compound with inert gas under pressure. Formerly, the Company used air under pressure, but this created an explosion hazard. National then switched to CO_2 generated by melting dry ice. Although this decreased the danger factor, it was an extremely expensive operation and very inconvenient. To modernize this process and cut costs, National installed a Kemp Gas Generator, Model MIHE.

Kemp Solved the Problem—and More

Now National's Kemp installation delivers a completely satisfactory inert—eliminating any danger of explosion. And it delivers it at a *much lower cost* than the former generating method. In addition, Kemp supplies the gas at the rate required, plus a reserve for storage. As for convenience, the company considers their unit entirely automatic—it is practically never touched. According to Mr. D. E. Stafford, Chief Engineer, "It just sits there and operates."

Kemp Can Solve Your Problem Too

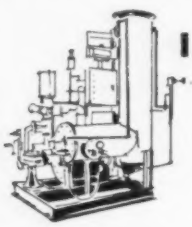
Every Kemp Generator is engineered for fast-starting, easy operation that saves both *time* and *money*. Kemp equipment delivers a chemically clean inert at a specific analysis . . . without fluctuations regardless of demand. And every Kemp design includes the latest firechecks and safety devices. For convenience, safety, and cleaner, more dependable gas—specify Kemp.



Mr. Wm. C. Graessle, of the engineering department, checking the operation. Generator features the Kemp Carburetor, part of all Kemp equipment, to deliver complete combustion . . . without waste, without tinkering.

For more complete facts and technical information, write for Bulletin I-10 to: C. M. **KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.**

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS • SINGEING EQUIPMENT

The Iron Age

INTRODUCES

J. J. Kraus, becomes vice-president, SHARON STEEL CORP.; and **D. A. Nabb,** appointed general manager Detroit Tube & Steel Div., Detroit.

William J. Athanson, appointed vice-president in charge of automotive sales, NATIONAL AUTOMOTIVE FIBRES, INC., Detroit.

Harold D. Jolley, appointed senior vice-president and manager of sales, CECO STEEL PRODUCTS CORP., Chicago.

William T. Kiehl, Jr., named assistant to the executive vice-president, ROCKWELL MFG. CO., Pittsburgh; **W. M. Connor,** becomes general manager; and **Earl Hudson,** named assistant general manager.

Carl E. Overton, elected vice-president in charge of sales BRAD FOOTE GEAR WORKS, INC., Cicero, Ill.

William R. Hough, elected a director, RELIANCE ELECTRIC & ENGINEERING CO., Cleveland.

Jack W. Watson, appointed director of public relations, and advertising KAISER ALUMINUM & CHEMICAL CORP., Oakland.

Richard H. Cole, appointed technical service engineer, MINNESOTA MINING & MANUFACTURING CO., St. Paul, Minn.; and **George D. Cockcroft** has been promoted to assistant sales manager.

William B. Powell, appointed director of industrial relations, Mechanics Universal Joint Div., BORG-WARNER CORP., Rockford, Ill.

Allan Chilton, appointed chief engineer, Aviation Gas Turbine Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Robert H. Groman, promoted to director of Applied Welding Engineering, EUTECTIC WELDING ALLOYS CORP., Flushing.

Paul Sullivan, appointed director of public relations, U. S. STEEL CORP., Chicago.

Harold F. Larson, appointed general office manager, MINNESOTA MINING & MANUFACTURING CO., St. Paul, Minn.

David E. Pierce, appointed director of manufacturing control, DIAMOND ALKALI CO., Cleveland.

John A. Faas, appointed chief mechanical engineer, WALTER KIDDE CONSTRUCTORS, INC.

Sam D. McIlwain, becomes product engineer, Engineering Dept. DETROIT STAMPING CO.; and **John M. Thullen,** appointed purchasing agent.

Harold C. Sproule, appointed district sales engineer, HYDROPRESS, INC., and its Loewy Rolling Mill Div.

Thomas Hinchliff, appointed project engineer, AMERICAN RESEARCH CORP., Bristol, Conn.

M. E. Powers, appointed manager-Government Sales Dept., WYANDOTTE CHEMICALS CORP., Wyandotte, Mich.

John T. Parker, becomes manager of its coal properties at Wheelwright, Ky., INLAND STEEL CO. He succeeds E. R. Price, who retired Feb. 1.

W. A. Anderson, appointed manager of Operations, PITTSBURGH SCREW & BOLT CORP., Pittsburgh, succeeding **Wallace W. Smith** who will remain with the corporation in an advisory capacity.

J. N. Vincent, appointed manager, new Customer Engineering Dept., CONTINENTAL CAN CO., New York.

A. R. EDWARDS, elected president of Armco International Corp.

WILLIAM A. BAUER, elected president, The Baker-Raulang Co., Cleveland.

FRANK A. MESTA, elected executive vice-president, Mesta Machine Co., Pittsburgh.

Personnel

Leslie C. Whitney, promoted to manager of Development Engineering, Wire & Cable Div., COPPERWELD STEEL CO.; and **Harry F. Zinsser,** appointed chief metallurgist.

Glenn J. Gibson, appointed to the engineering staff, THE COOPER ALLOY FOUNDRY CO., Hillside, N. J.

Joseph E. Consolmagno, appointed assistant to the manager of public relations services, CHRYSLER CORP., Detroit.

Eugene F. Anderson, appointed district manager of the New York-New England territory, Pittsburgh Crucible Div., CRUCIBLE STEEL CO., Pittsburgh.

John T. Duffy, appointed to the sales staff of N. T. GATES CO., Philadelphia.

Robert L. Larson, appointed manager, Alloy Steel Div., JOSEPH T. RYERSON & SON, INC., Chicago; and **William P. Loehrer,** becomes manager of alloy steel sales and related activities.

C. Wayne Clark, appointed sales manager, Lamp Parts Div., New York office, THE PLUME & ATWOOD MFG. CO., Waterbury, Conn.

Merton E. Wade, named superintendent, KAISER STEEL CORP., Fontana, Calif.

M. E. Swaim, appointed general manager of oil field sales, THE NATIONAL SUPPLY CO., Pittsburgh.

Lyle F. Gulley, appointed works manager, GRANITE CITY STEEL CO., Granite City, Ill.

H. A. Harrington, appointed assistant general manager, Leschen Wire Rope Div., H. K. PORTER CO., INC., St. Louis.

Richard H. Ewert, appointed general sales manager, ILLINOIS GEAR & MACHINE CO., Chicago.

D. H. W. Felch, appointed Far Eastern representative, AMERICAN CYANAMID CO., New York.

JOHN D. IVERSON, elected vice-president in charge of operations, Mesta Machine Co.

WALLACE L. HOWE, elected vice-president in charge of research and development, and to the board of directors, Norton Co., Worcester.

ROBERT SMITH, elected a vice-president, Pittsburgh Screw & Bolt Corp., Pittsburgh.

HENRY H. HOWARD, elected a vice-president, Caterpillar Tractor Co., Peoria.

—Personnel—

Continued

Glenn F. Johnson, was transferred to San Antonio as district manager, SHEFFIELD STEEL CORP., Kansas City; and **George P. McCracken,** becomes district manager at Dallas, Tex.

J. L. Pringle, appointed assistant to the general superintendent, San Francisco Shipyard, BETHLEHEM PACIFIC COAST STEEL CORP., Shipbuilding Div.

R. P. Vallee, appointed representative, Eastern Wisconsin and Upper State Michigan, CLEVELAND HARDWARE & FORGING CO., Cleveland.

Joseph J. Cizas, appointed field sales representative, HANSON-VAN WINKLE-MUNNING CO., Matawan, New Jersey.

W. T. Bryson, becomes sales supervisor, District 5, SCAIFE CO., Oakmont, Pa.

Vernon D. Enwald, appointed a national account representative, Automotive Div., WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis.

OBITUARIES

D. Birney Stokes, former vice-president in charge of sales, United States Pipe & Foundry Co., at his home in Edgewater Park, N. J.

Dr. Paul G. Agnew, 72, former secretary of the American Standards Association. He was one of the pioneer leaders in standardization in the United States.

David M. Myers, 75, consulting engineer, at his home in Larchmont, N. Y.

Robert S. Leather, founder and chairman of the board, The Lea Mfg. Co., Waterbury, Conn.

George F. Lasher, 60, plant manager, Detroit Stamping plant, General Motors Corp., Fisher Body Div., recently.

Harold W. Rogers, 70, retired engineer, General Electric Co., Schenectady, after a short illness, recently.

The Iron Age
FOUNDED 1855
Technical Articles

Good Industrial Styling: . . . Key to Higher Sales

By George W. Walker
Industrial Designer
Detroit

◆ Improvement of products through styling affects almost all items sold on the open market . . . Even with completely functional products, pleasing appearance increases saleability . . . Good styling frequently improves functional qualities as in the modern car and vacuum cleaner . . . On machine tools, good design promotes worker efficiency and increases pride of workmanship.

◆ Good styling begins with a thorough product search . . . It also requires full cooperation from management, sales, engineering and production since changes in material specifications and manufacturing methods may be involved . . . An independent viewpoint also helps.

◆ SOUND INDUSTRIAL STYLING and good industrial design involves considerably more than meets the eye of the casual observer. In addition to better sales appeal, a properly-styled product will function better. In many cases it will be easier to manufacture. Because of its enhanced sales appeal, it should be easier to advertise and merchandise.

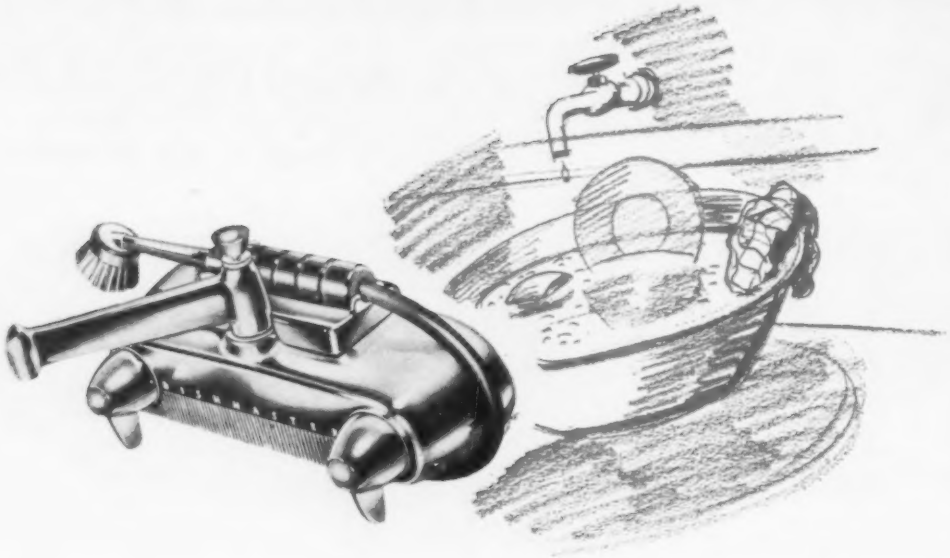
The principle of product-improvement-through styling applies to practically all products being sold in the market today. In today's intensive competition, styling is important even to plows and manure spreaders. This fact should not be overlooked: even a snow plow is sold on a showroom floor.

Farmers living in rural areas are particularly conscious of styling nowadays. Check this fact for yourself: is it possible to buy a poorly styled plow or tractor? This lesson has been demonstrated many times—a company that has a good functional unit has good respect for styling.

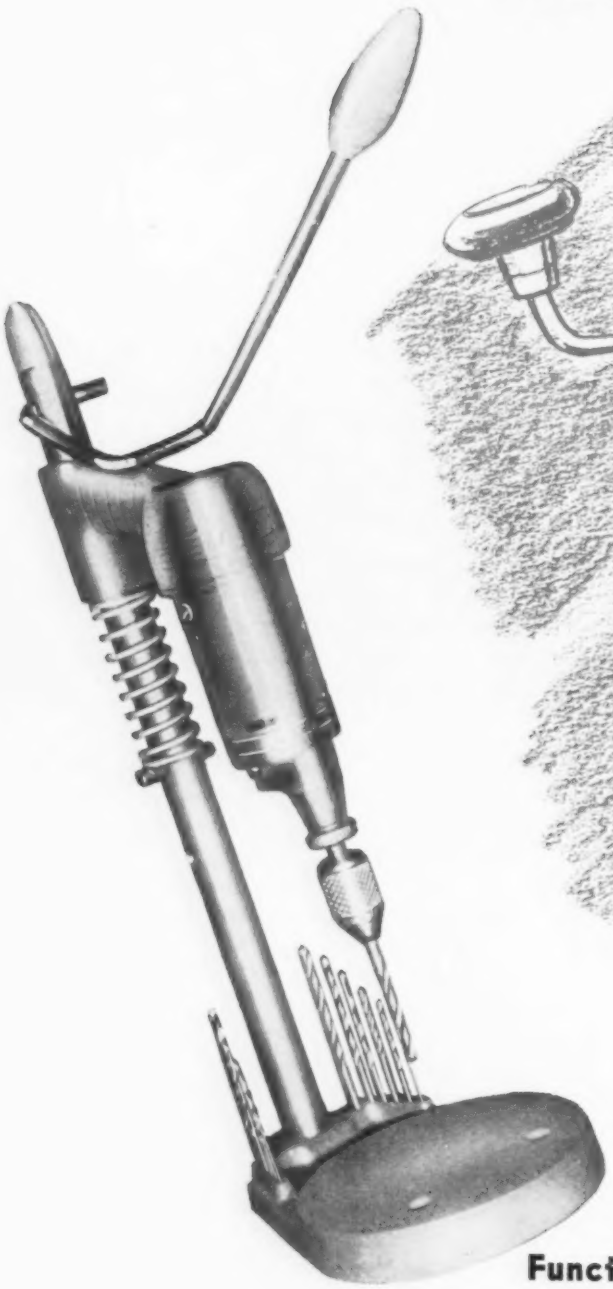
Why should a battery that goes under the hood of your car be styled? The answer is that several million batteries are purchased every year off the showroom floor.

Industrial styling must meet a number of inflexible requirements. The design should look clean. It should be easy to keep clean. Clean design invariably helps merchandising.

Why do we call a pleasingly designed refrigerator streamlined when there is no actual streamlining? Streamlining is a word applied to objects designed so that the swift movement of the eye over the product is uninterrupted. The eye passes quickly over the design; there is nothing to interrupt it. What we are usually talking about



It broke down buyer resistance . . .



Functional improvements plus styling

when we speak of streamlining then is that the design is clean and pleasing to the eye.

You can do something with even a homely egg beater through styling. While an egg beater is supposed to be 100 pct functional, it can also be designed so that it is pleasing to the eye. The design looks modern and clean; it attracts and holds attention. The design is functional—but it also has sales appeal.

Good styling is seldom a one-shot affair although the designer may sometimes come up with a satisfactory design on the first try. Prior to attempting to redesign a product, all products of that type on the market should be studied.

Products that are selling well should be examined in minute detail. Their functional qualities and sales appeal should be critically evaluated.

Styling becoming a science

When an industrial designer studies a clock, for instance, he knows when the product has what stylists call "good feeling." Experience will usually tell him which products are selling well and which are not moving in competition Sales are not proof positive of good styling since even a poorly-styled product, backed by sound advertising and merchandizing, may sell very well, despite its design weakness.

Display also plays a prominent role in marketing. "You can't sell a diamond in a match box" is even truer today than it was a few years ago.

Styling is not a science but it is rapidly becoming a science. There are a number of simple laws of styling that are as inexorable as the law of gravity. Designers have a word for one of these unwritten laws; they call it "tumble-home." You can't find the word in most dictionaries. According to Funk & Wagnalls, the word has a nautical derivation: "That part of some vessels' hulls which leans inward, above the line of greatest breadth. The distance or amount of leaning on one side of the vessel as, the vessel has 1-ft of tumble-home."

Has symmetry and grace

As early as the 14th century, European boat builders were using tumble-home. American industrial designers first began to use the tumble-home principle early in the 1930's. Sketches of cars with tumble-home caught the eye of the Detroit car manufacturers. After the adoption of tumble-home by the car producers, public consciousness of this pleasing effect grew very rapidly.

Tumble-home is, first of all, pleasing to the eye. There is an indefinable symmetry and grace in the design. Horizontal and vertical lines are either softened or entirely eliminated. Tumble-home relieves the eye. A cracker box with tumble-home can become a product with sales appeal.

The tendency to imitate a successful product is always with us. This may explain, for example, why the dials on a stove may carry considerable resemblance to an automobile instrument panel. Automobile designs undoubtedly have been at least a partial source of inspiration for radios, clocks, and electrical ranges.

It is often surprising how much can be done to improve the eye appeal of even a product like an oil burner. A few years ago, the industrial design firm of George W. Walker, Detroit, was asked to redesign the Timken oil burner. Prior to its redesign, the Timken unit was square—and straight up and down. The new design features considerable tumble-home. The skirt is not only more pleasing to the eye, but is an improvement from a functional standpoint. A number of manufacturing operations were eliminated in the new product.

Our experience with clocks may help to show how new product design may simultaneously help manufacturing and sales. A design for a clock was conceived, working closely with engineers, sales executives and manufacturing. Tooling experts also participated. The new product was an improvement from the standpoint of each of the interested departments. This is the ideal approach to styling—although not the most widely used.

Color stimulates sales

Styling may not only change the design—it may change the material specifications as well. For example, in redesigning a kitchen clock a few years ago, the clock was restyled for plastic. This decision eased some of the design limitations that might have been imposed by stamping or die casting. Color was also an important consideration in this case.

Industrial designers are sometimes called upon to design a product for an entire industry. An example was an egg beater designed for the Die Casting Association.

In 1934 a new clock was designed for the Gilbert Clock Co. Prior to that time, all Gilbert clock cases were metal stampings. The clock was redesigned as a die casting. A total of 1,200,000 clocks were sold in a single year. The new clock outsold its cheaper priced competition by a wide margin. It also made a big hit with the "Shawl trade" that is often willing to pay a little more for a product that has outstanding sales appeal. Effective advertising, sound display and merchandising all combined with styling in this sales success story. This is the way most successful products are built up to outstanding public acceptance.

Minimize the negative

When restyling an air conditioning unit a few years ago, these considerations dominated the thinking: (1) good lines, (2) attractive, round corners, (3) reduction in size—it must appear to occupy minimum space. In the final product, each of these objectives was reached. In addition, the new unit was easier to manufacture.

The vacuum cleaner is another example how

desirable qualities can often be designed into a product—at the same time minimizing negative characteristics. Several years ago a new cleaner was designed that would go under bed and chairs easily. At the outset, however, it appeared impossible to get an electric motor that would fit the new low design. Eventually, a motor was found that could be used and the low hug-the-floor pancake design of vacuum cleaner was introduced. The product was an immediate market hit—and still is.

The modern motor car is the outstanding example of creating desired effects through emphasis of certain details of design. Today's cars are built lower to the ground than earlier models. They look sleeker, wider, lower and more streamlined. Actually, cars have changed somewhat dimensionally but the effect on the eye is much more pronounced than the actual reduction in height, width and length of the car.

It is necessary sometimes to start from scratch on a new industrial design. There were no predecessor products, for example, for the popular Dishmaster. The objective was to design a product that would wash dishes successfully but would also have better appearance than the faucets on the kitchen sink. This product looks good, is easy to keep clean and actually enhances the appearance of the kitchen sink.

Good design does not always come easily. The job begins with a thorough product search. There are usually frequent conferences with engineering, sales and manufacturing. The job may require ten sketches or it may require 100 sketches. Success seldom comes quickly.

An independent viewpoint is important for good design. While every effort to cooperate with management, engineering and production is made, stylists must know their business and must lead the way if the result is to be satisfactory to both the stylist and his client.

No one minimizes the importance of styling in the automobile industry any more. Manufacturers who have styled their cars have been able to sell them. Disregard of the importance of styling has been reflected both in customer buying resistance and dealer problems.

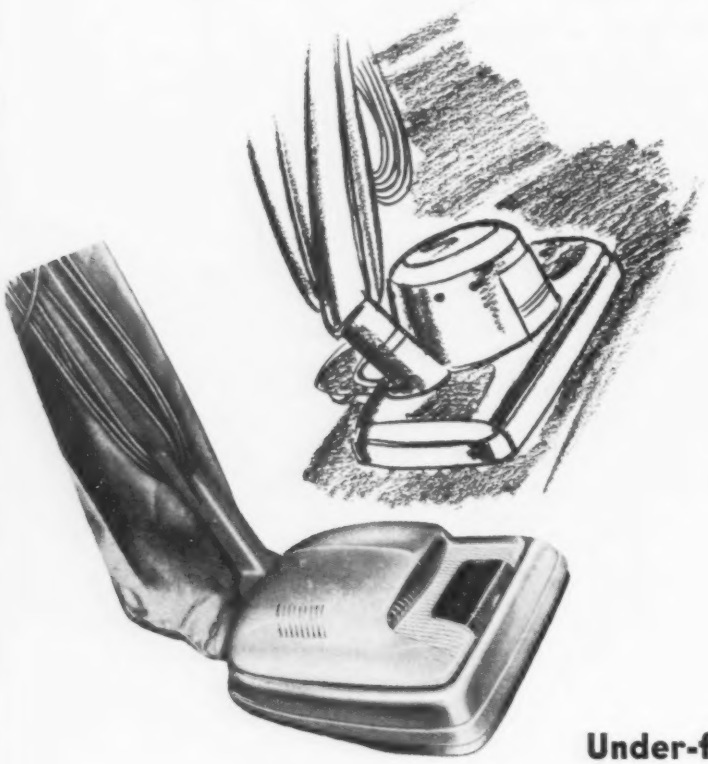
To the automobile business, styling is a multimillion dollar business. Many interests must be satisfied. Compromises are necessary—they also take time. The time required to style a new car can be considerably shortened, however, where a deadline is set and there is mutual determination to meet it. For example, the 1949 Ford passenger cars, except for a few minor details, were completely restyled in 3 months. This had never been done before in the history of the automobile industry. Without 100 pct cooperation from Ford, this deadline could not have been met.

At first 15 to 20 sketches were submitted to Ford management. This was reduced to 12 large illustrations, quarter size. Out of the 12 sketches, Ford selected three. Wood bucks, quarter size, were made of these three sketches. These were later built in clay and painted. Modifications were made to meet several minor objections by engineering and manufacturing. One design was accepted by Ford and built to full size at Dearborn. Plastic and plaster models were also made. Final redesign of the front end took a little longer.

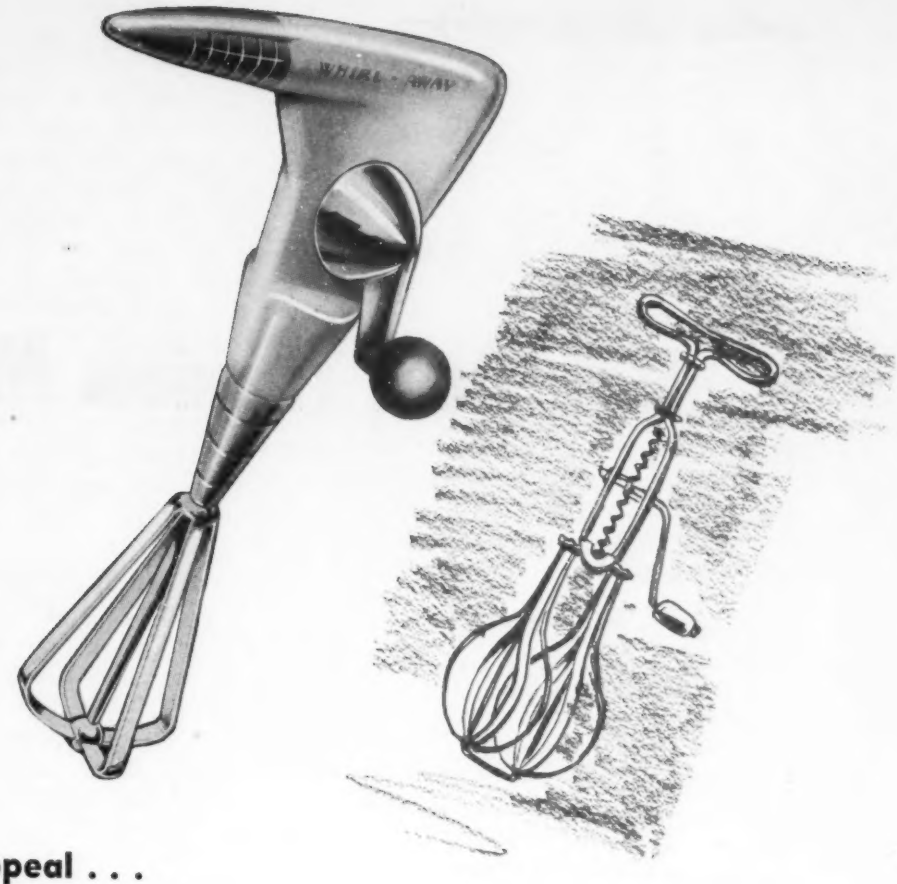
Chain store buyers, in particular, have become style conscious. Many of these buyers will not buy a poorly designed product. A good example is a low-cost drill press redesigned for sale by a leading merchandizing chain. This drill press can also be used as a hand drill. The base, hand lever and other features of this low-cost, popular drill press were changed to improve its customer appeal. Even the paint job was carefully studied to improve customer acceptance.

A limited effort has been made by the machine tool industry to restyle some of its products. A number of years ago, an industrial stylist was employed by a leading machine tool builder to restyle its machines. This was one of the first attempts at styling by the machine tool industry. Good styling, when combined with good color and other features, increases pride of workmanship. It may also improve worker efficiency. An eastern shoe manufacturer improved plant productivity substantially simply by providing clean, newly painted tools for his employees.

There are also sound economic reasons for good styling. If industrial products are pleasingly styled, they usually sell well.



Under-furniture design makes hit



Took on new sales appeal . . .

Smooth flow lines catch eye . . .

How Does Titanium Machine?

Part III

By O. W. Boston
Chairman
Dept. of Production Engineering
University of Michigan
Ann Arbor, Mich.

◆ If you're machining titanium here's valuable data on drilling and reaming which you can put to practical use . . . Super high speed drills of the thick web type have given good results . . . A sulfurized chlorinated mineral oil makes an excellent cutting fluid for titanium.

◆ Most critical problem in reaming is pickup of material on the margin of the reamer . . . Surface scale can cause excessive wear of blade teeth in power hack sawing . . . Stick to slower speeds in bandsawing for longer blade life.

◆ LONGER TOOL LIFE for drills and reamers can be obtained in machining titanium and its alloys by using tools specifically adapted to these materials, proper lubricant, and best feeds and speeds. These conclusions are based on extensive studies by research engineers of the University of Michigan on the machinability of titanium. The research project was planned by Watertown Arsenal and the Detroit Ordnance District of the Armed Services.

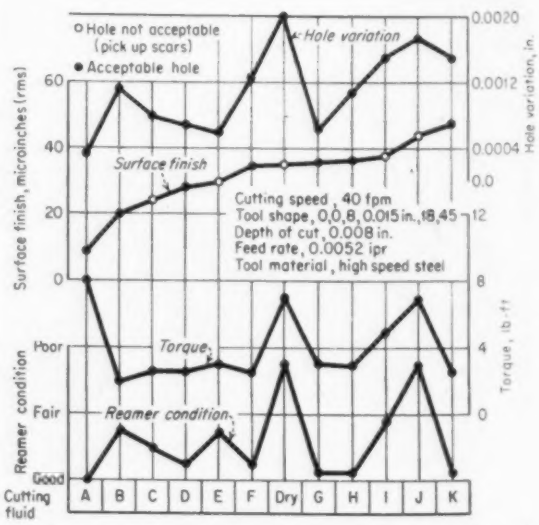
Drill stiffness is of great importance. High helix angles were found to reduce torque and thrust. Low helix angles gave poor performance. Cutting speeds of 70 fpm for pure titanium, Ti-75A, and 30 fpm for the titanium alloys are recommended.

A 201 ¼ Barnes Co. drill press with S-4 strain gage type dynamometer was used. Standard twist drills of high speed steel with an oxide surface treatment in ¼, ⅜, ½ and 1 in. diameters were used in the studies.

Highest torque and thrust was found in RC-130B. All other metals had about the same torque and thrust values for a given feed. Horsepower per cubic inch per minute required is highest for RC-130B at 2.52, intermediate at 1.42 for Ti-150A and SAE 1045 steel and lowest at 0.99 for RC-130A.

A sulfurized chlorinated mineral oil performs best as a cutting fluid for Ti-75A in reducing torque and thrust. A mineral oil also gave low torque but high thrust. Dry cutting gave highest torque but lowest thrust.

In drill life studies the standard 30° helix angle drill gave the largest number of 1-in.



EFFECTIVE cutting fluids included: Sulfurized chlorinated mineral oil (D), oleic acid (B), carbon tetrachloride (A).

This is the final article in the series "How Does Titanium Machine?" Part I appeared Jan. 21; Part II appeared Jan. 28. The author wishes to thank Profs. L. V. Colwell, W. W. Gilbert, R. E. McKee, W. C. Truckenmiller, Joseph Datsko, Frank Sowa and Messrs Philip Visser and R. M. Caddell for their work in the research and preparation of reports.

deep ⅜-in. holes in Ti-75A at 84 fpm (857 rpm), 0.009-in. feed, using a 1:20 emulsion. Drill life was based on 0.030-in. flank wear.

Chips are less tightly spiraled on all materials at the lower feeds and become tighter as the feed is increased. In deeper holes, the chips fold and block the cutting fluid which in turn causes chips to jam in the flutes.

Sharp drills produce a continuous tightly wound chip which becomes tightly folded as the drill dulls. Higher temperatures developed by dull drills soften the thin chip and cause it to fold. This leads to clogging of flutes and drill failure. Excellent performance was obtained with super high speed steel drills of the thick web type and crank shaft point. Carbide tipped drills of the low helix type gave poor performance.

No work hardening with high speed

Generally when dull drills and the usual feeds and speeds are used, the surface of a drilled hole will be work-hardened. The titanium alloys RC-130B and Ti-150A will have approximately the same surface hardness as a 304 stainless steel and may cause tool damage unless cutting speeds are reduced. The matrix of the titanium alloys is harder than that of stainless steel, indicating there is less work-hardening in the titanium alloys.

No difficulty was encountered in restarting a drill in a work-hardened hole if cutting speeds were reduced. Titanium may be cut at higher speeds and feeds without increasing the work-hardening, while stainless steel should be machined only with light feeds, slow speeds, and sharp tools. Cutting fluids have only a slight effect on work-hardening.

BANDSAW TOOL LIFE

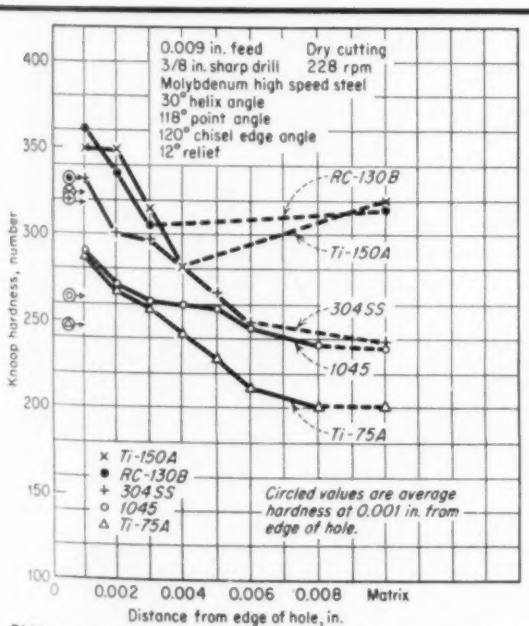
Material	Feed = 80 x 10^{-6} ipt		Feed = 120 x 10^{-6} ipt	
	Velocity 60-min Tool Life	Pct of 1045 Value	Velocity 60-min Tool Life	Pct of 1045 Value
SAE 1045	218	100	197	100
Ti 75A	98	45	85	43
RC 130A	70	32	59	30
Ti 150A	65	30	51	26
RC 130B	43	20	35	18

Titanium and its alloys can be deep-hole drilled successfully. Cutting speeds, for the alloys, when using the harder grades of carbide-tipped drills should be between 100 and 170 fpm. For pure titanium a speed of 220 fpm is better. Feeds should not be greater than 0.0005 ipr for proper chip formation.

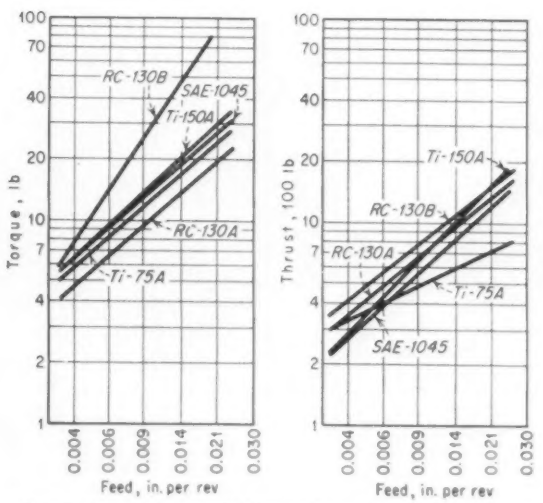
The several metals, in the form of bar 1-in. in diam and 34-in. long, were drilled in a Pratt and Whitney No. 2 horizontal deep-hole drilling machine in the plant of the National Twist Drill & Tool Co. Standard center cut and 'Target' trepanning drills, both ½ in. in diam by 44-in. long were used. Stanoil No. 75 cutting oil was applied at 600 psi.

Pick-up of material on the reamer margin is the most critical problem in reaming. This produces high torque values, poor finish, oversize holes and poor reamer condition. Cutting fluids are effective and essential in controlling pick-up. A sulfurized chlorinated mineral oil was selected as the most effective commercially.

Feed should generally be held below 0.0007 in. per tooth. Moderate speeds of 20 to 30



SURFACE METAL of holes drilled in titanium is generally work hardened, the study found.



TORQUE AND THRUST values in drilling were studied using a ½-in. drill at 29.4 fpm.

"Ti-75A can be cut at all speeds but low speed gives better wear. Use of a coolant and full feed pressure increases the feed rate. . . ."

fpm for the alloys and 40 to 50 fpm for pure titanium are recommended.

Reaming tests on Ti-75A, Ti-150A and RC-130B were carried out on a Monarch 12-in. swing engine lathe, equipped with a 5 hp Thy-Mo-Trol speed control. The specimen was clamped in a vise mounted on the lathe cross-slide, center-drilled and then predrilled or prereamed to size.

The test reamer was placed in a special strain gage, torque-thrust dynamometer, the shank of which was carried in the lathe chuck. The effect of torque and thrust during reaming was measured and recorded. At first 75 high speed steel, 13/16-in. diam, machine reamers were provided and tested.

Depth of cut affects finish

Small widths of margins are necessary to prevent seizure and scoring. For values below 0.010 in., there was a tendency to chatter. Small relief angles help eliminate chattering.

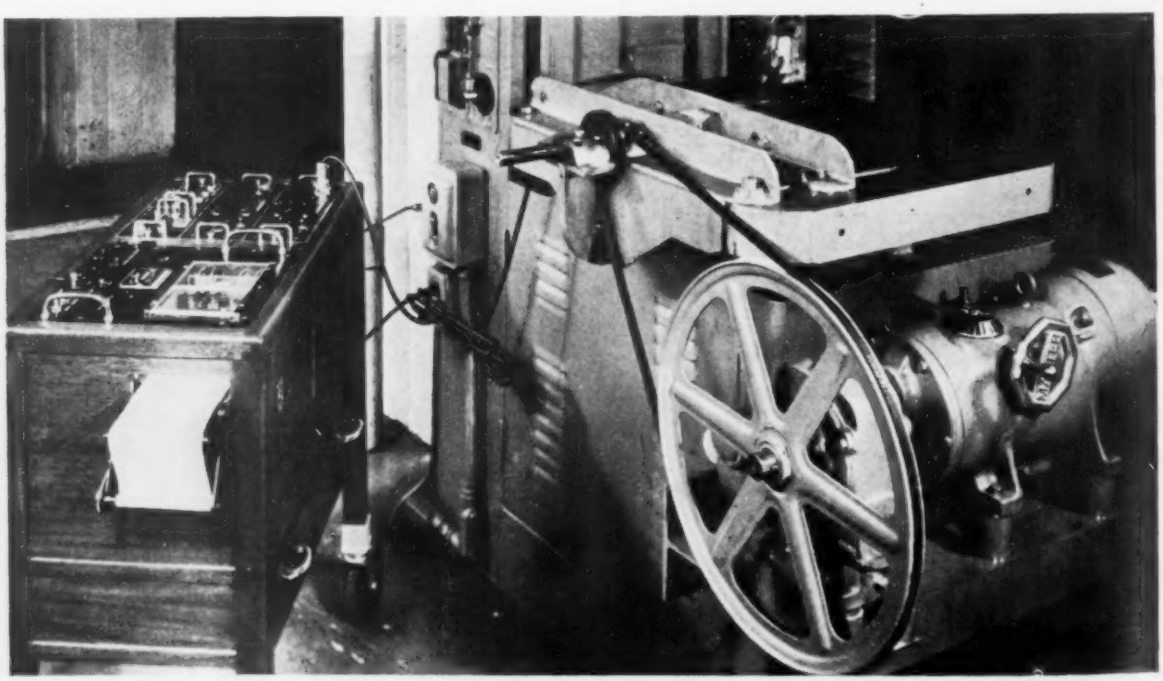
After cutting with a new reamer, it was removed and checked for wear and pick-up of metal, using a toolmaker's microscope. The specimens were cleaned and examined for pick-up, scars and other surface defects, after which the surface finish was measured.

Increasing the normal chamfer relief angle gave slightly better surface finish, lower torque and less pick-up. Values above 10° caused chatter at the start of the hole. Decreasing the depth of cut showed a trend toward better surface finish and lower torque. Smaller chamfer angles produced a smoother surface finish but also gave thinner chips and higher torque. Axial rake (helix angles) of 0°, plus 10° and minus 20°, had little effect on surface finish, torque, hole size or reamer condition.

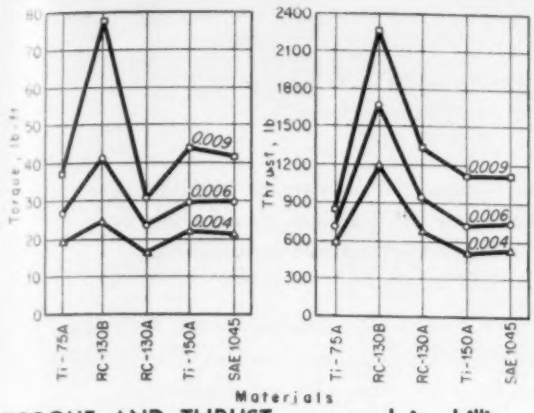
Titanium alloys can be sawed more satisfactorily using positive power feed. Relative machinability of the five materials studied is about the same for bandsawing as for turning.

End of useful tool life in bandsawing is accompanied by an abrupt increase in feeding force required to sustain the same rate of cutting. Both cutting and feeding forces vary linearly with the feed rate, except for residual values at zero rate of cutting. Feeding force for sawing SAE 1045 steel is about half the force required in the cutting direction. Feeding force for Ti-75A is the same as that for cutting. The feeding force for titanium alloys is substantially greater than that required in the cutting direction. The co-efficient of sliding friction between titanium and the bandsaw material appears to be significantly less than for SAE 1045 hot rolled steel.

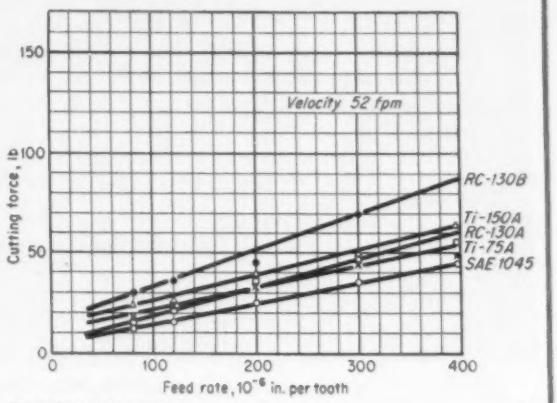
A relation between cutting speed and tool life was established for each of two computed infeeds of 80 and 120 x 10^{-6} in. per tooth. Tool life was taken as the time in minutes required to establish a feeding force of 100 lb. Usefulness of the saw diminishes rapidly thereafter.



BANDSAW, a Grobe 23-in. with variable feed drive was also equipped with a two-component strain-gage dynamometer and Sanborn recoredr. At high speeds saws fail rapidly.



TORQUE AND THRUST compared in drilling titanium with 1-in. high speed steel drill.



CUTTING FORCE vs. feed rate are compared in bandsawing studies on titanium materials.

Values of unit horsepower at the cutter for bandsawing the several metals at feeds of 80 (and 320) millionths in. per tooth are: SAE 1045, 4.0 (2.6); Ti-75A, 5.7 (4.0); RC-130A, 5(3.5); Ti-150B, 6.4(4.5) and for RC-130B, 8.6 (6.0). Values for the heavier cuts are lower than those for lighter cuts. Speed values for 60-minute tool life, are given in the table.

The relation of feeding force to sawing time at 78 fpm was established. At higher speeds the titaniums cause more rapid saw failure.

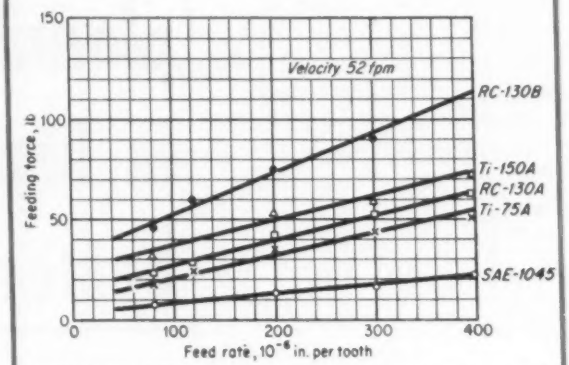
Surface scale caused excessive wear of blade teeth in power hack saw tests. Maximum feeding pressure of 450 to 600 lb was required in all tests. With a coolant, heavy feed pressure and slow cutting speed, the saw blade wears gradually and useable life depends upon how small a feeding rate can be tolerated economically. At higher speeds, or without coolant the temperature of cutting became excessive and chip welding and seizure occurred.

Low speed cuts better

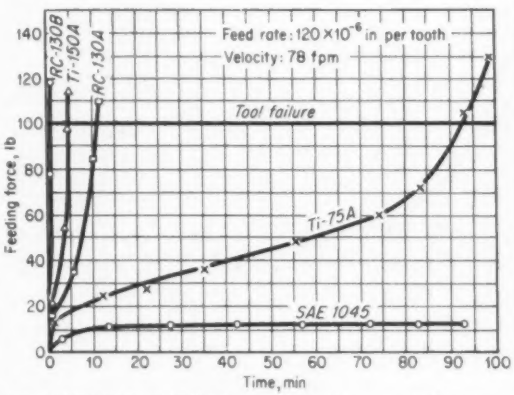
Pure titanium and two of its alloys were compared with hot rolled steel. A Peerless 'Hydracut' power hack saw, 14 x 14-in. with a 6-in. stroke, having speeds of 56, 98 and 140 strokes per minute was used. Blades 21-in. long by 2-in. wide and 0.100-in. thick, with 4 teeth per inch, in both tungsten and molybdenum high speed steels were used.

An emulsion of one part soluble oil to 20 parts water was used in all tests. The material, 2 in. by 4 in. in cross-section, was sawed across the 2 in. width so that a 3/16th-in. piece was cut off in each test.

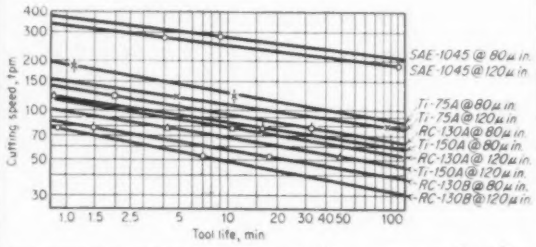
Ti-75A could be cut at all speeds but from a wear standpoint, low speed was best. A coolant was necessary and the full feed pressure gave greater feed rates with no noticeable increase in blade wear. The molybdenum high speed steel blades gave larger feed rates than the tungsten steel blades. The effect of surface scale was not apparent.



FEEDING FORCE and feed rate were also compared in bandsawing studies.



AT HIGHER SPEEDS the titanium metals cause much more rapid failure of bandsaws.



CUTTING SPEED and tool life compared using a 3/4 in. wide, 6 pitch, Simonds Hard Edge blade.

◆ More efficiency and better working conditions can be built into your plant by carefully planning each step before construction starts.

◆ That's how Ohio Screw Products tackled the problem of getting more than just a building when it put up a new plant . . . A semi-circular bay on the L-shaped building eases loading of multi-spindle automatics.

◆ The method of handling cutting oil, including pump, filters and trench return, has cut maintenance costs . . . Oil extraction, chip handling, parts washing, and inspection facilities received special attention.

planning pays off in higher efficiency, better working conditions

By W. D. Latiano
Metallurgical Editor

◆ CAREFUL PLANNING before building has paid off in greater plant efficiency and substantially improved working conditions at the new plant of Ohio Screw Products Inc., Elyria, Ohio. Many "improvements" normally considered luxuries—a plant cooling system—were made at relatively low cost. A building closely tailored to the needs of a job screw machine shop has permitted handling of long and short runs with equally high efficiency.

Ohio Screw Products, employing about 80 people, specializes in production of screw machine products from carbon, low-alloy and stainless steels, and from aluminum, brass, bronzes, copper and magnesium. Back in 1949 the company found itself badly cramped for space. Planning started then for a more efficient plant.

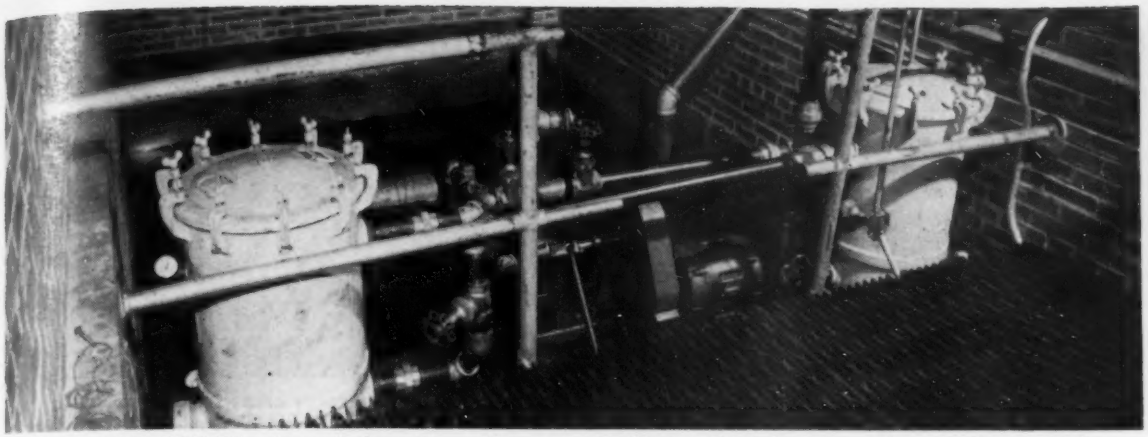
Three years later the new building was ready for use. In designing the building every effort was made to consider all factors which might affect plant operation. Best space usage and greatest plant flexibility were desired. Close attention to the safety and comfort of personnel were basic in building design.

For best utilization of floor space the building was designed as a modified "L". The main production department was separated from the finishing and related departments by offices and general service areas. The building is 40 ft wide and if stretched out straight would be more than 400 ft long. A bay, almost half of an 80-ft circle, was added to one wing to accommodate a bank of 15 multispindle automatic screw machines. Total floor area is 17,000 sq ft. Despite the large floor area, narrow design of the building permitted use of relatively lighter cross beams.

The centrally located general service area is equally accessible from all departments. More important, however, the area separates operations. Some departments are noiser than others. This separation adds to operator comfort and increases efficiency by reducing the noise level.

Raw material is usually in the form of stock length bars or tubing. As stock is needed bars or tubes are taken from storage bins and placed on a dolly. The dolly and stock are then weighed and carried to the machine by a Towmotor lift truck.

The multi-spindle Acme-Gridley automatics are spotted around the periphery of the semi-circular bay. Heads of the machine are next to the windows. Bar stock brought to the auto-



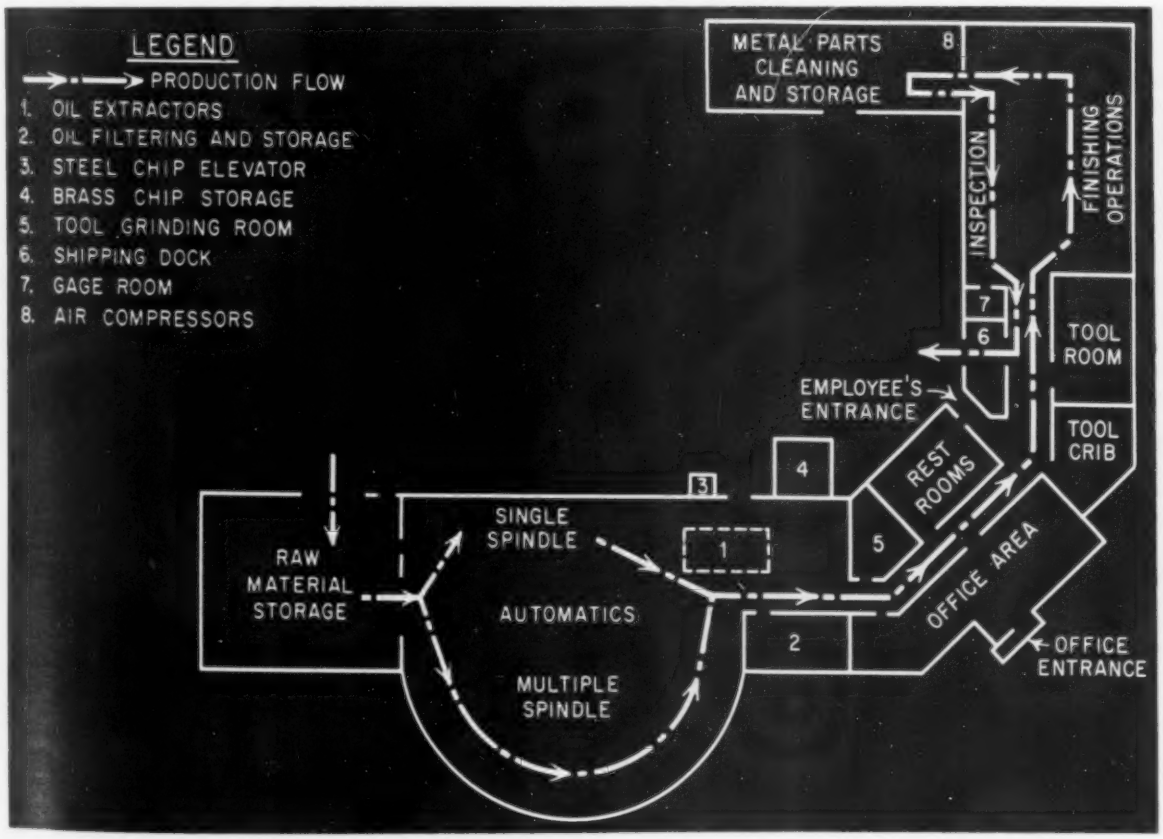
PUMP AND FILTERS of central cutting oil system. Baffled tank helps to settle out dirt particles.

matics can be easily slid off the Towmotor to racks over the feed tubes. This arrangement permits loading from one central area. Danger of accident during loading the long lengths of stock has been minimized. Bars for the 12 single spindle Brown & Sharpe's are brought in on dollies and restocked at the automatics.

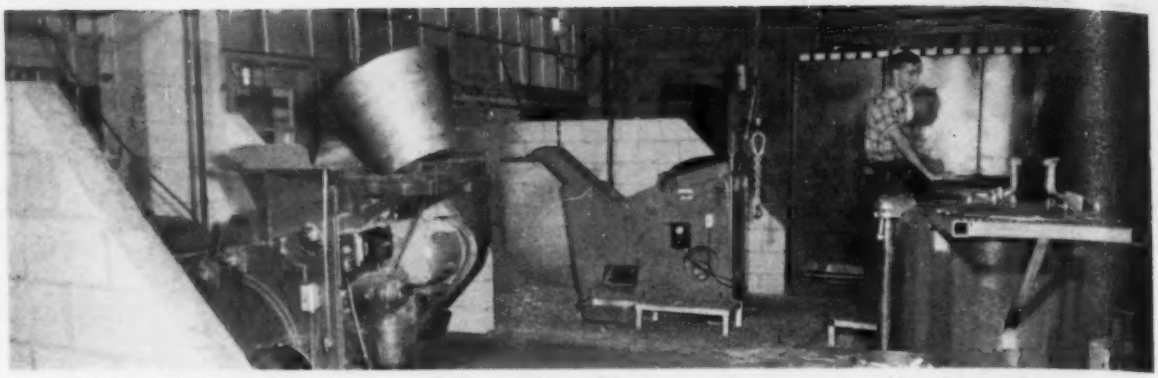
Since a wide range of materials is used, chip handling cannot be completely conveyorized. Conveyors built in the automatics move chips, as they form, to scrap boxes under the stock reels. When the chip boxes are full, the Towmotor takes them to the centrifuge oil extractors. After the oil has been removed, a small overhead crane is used to pick out the centrifuge basket. Since some baskets of chips may contain a few stray parts, the cleaned chips are dumped into a chip blower separator. Chips are blown out of the machine and into a hole in the floor.

At this point a conveyor takes over and transports the brass chips to an overhead storage bin located in the scrap loading area outside the building. The conveyor loads steel chips directly into a scrap trailer supplied by a scrap dealer. Individual oil extractors, chip separators and conveyors are used for brass and steel. This chip handling method avoids extra handling later. The volume of chips for metals other than brass or steel is relatively small. These are collected and stored in separate bins until sold.

Handling of cutting oil is one of the impor-



BAY FOR AUTOMATICS is a feature of the new plant. General service area divides building.



CENTRIFUGE, right, extracts oil from chips. Blower, center, separates chips from stray parts.

tant cost factors in operation of an automatic screw machine plant. Ohio Screw Product's oil system was planned to obtain highest efficiency with least operating expense. A main storage pit is located off the automatic department. The pit, 10 ft wide, 15 ft long and 5 ft deep, holds 6000 gal of oil. The pit is completely enclosed in a bricked room with only one opening, a fireproof door. Pumps, filters and other oil handling equipment are also located in this oil room.

Each machine draws from oil line

An electric horn over the door of the oil storage room keeps tabs on excess pressure in the filter system. A light remains on as long as the pumping system is working. Cutting oil at the multispindle automatics, is pumped through 2 filters to a 2000-gal tank located above the bank of automatics. From the tank the oil flows by gravity through a 4 in. line around the periphery of the circle of machines at a height conveniently above the machines.

Each machine has its own take off from the main supply line and can be turned on and off as required. Oil may be directed to any cutting tool as needed and then drains into the main reservoir of the machine. At the same time the machine's own cooling system pumps cutting oil to the various cutting tools. With this system a more than adequate supply of oil is assured at the machine.

Oil drains to trench

Due to the constant supply from the main overhead tank the machine reservoirs are always at full level, an overflow drains into a gutter under the machines. This is covered with steel plates and runs from the farthest machine to the storage room. A similar drain trench carries oil from the extractors to the storage room.

This system helps keep cutting oil temperature from 20° to 30°F cooler than when machine reservoirs only are used. The system has increased tool life up to 15 pct, management claims. Oil life is much greater because less oil is burned at the tool.

In the trench, the oil moves swiftly to the oil room, thus preventing any amount of settling out in the trench. From the trench, the oil flows into a baffled settling tank in the oil room. This tank slows down the flow of the oil. Much fine particulate matter drops out before final delivery to the filters and main supply tank.

Parts are handled either in steel pans or on tote boards. The pans or boards are stacked on pallets and carried by Towmotor to the washing room. Here parts are washed in Blakeslee rotary drum type metal cleaning machines. Two machines are used, one for nonferrous metals and one for steel. After cleaning, parts are stored or sent to secondary operations or inspection.

Secondary operations include drilling, shaving, centerless grinding, milling, tapping, and other machining. After parts are completely processed in these secondary operations they are returned for washing and storing.

Has low-cost cooling system

Since the shipping department is on the same floor level as the rest of the building, one foot above ground level, special facilities were required to make truck level loadings. For this purpose a floor level platform with built in 5-ton hydraulic hoist is used. When a truck is to be loaded, a shipment is placed on the platform and raised to truck floor height.

An unusual feature is the plant's low cost plant cooling system. The plant roof is flat. During hot weather the roof is always covered with 2 in. of water. This water is obtained from the air compressor and office air conditioning cooling systems overflow and from normal rain water. Evaporation keeps the temperature of the water low. In the hottest weather, the temperature is 10° to 12°F cooler inside than outside the building.

Equal thought has been given to the heating system. The shop is heated by radiant heat piping in the slab concrete floor. Baseboard radiant heaters are used for the office. The hot water heating system is controlled by indoor and outdoor thermostats. The outdoor thermostats permit the heating system to react rapidly to temperature changes outdoors. This in turn minimizes temperature changes inside the plant.

Tears whisked away—

ELECTROSTATIC DETEARING Improves Dip-Coating Quality

By J. J. Obrzut
Metal Finishing Editor

◆ Smooth, uniform coatings are obtained on dip-coated parts by removing paint tears and fatty edges electrostatically . . . A special electrode arrangement at high electrical potential attracts the paint from drain points in a matter of seconds . . . Soft paint films, wrinkles and chipping are avoided.

◆ Detearing provides for easier control over viscosity . . . By combining dip-coating and electrostatic detearing in a conveyorized setup, production increases, labor requirements are lower, and material usage is less . . . Rejects have been reduced to 1 pct or less.

◆ ELECTROSTATIC DETEARING has provided the answer for acquiring smooth, uniform painted finishes on dipped or flo-coated parts. This automatic process not only improves surface quality, but frequently makes possible the use of dipping and flo-coating where they could not be used otherwise. The process, developed by Ransburg Electro-Coating Corp., Indianapolis, removes tear drops and fatty edges which form at drain points of articles flooded with excessive paint.

After draining an article in the normal manner, it is exposed to a special electrode arrangement which is maintained at high electrical potential. The electrostatic field created with this equipment effectively attracts and removes remaining tears and fatty edges. In many cases the finishes are as good quality-wise as those obtained by electrostatic spraying. Use of the process is particularly desirable where soft paint films, wrinkles, or chipping from excessively coated edges must be avoided.

At the Midwest Plating & Chemical Corp., Logansport, Ind., electrostatic detearing in the paint line meant the difference between being able to use conveyorized dip painting over hand spraying. Among other things, Midwest finishes automotive replacement parts such as directional signal light parts and voltage regulator covers by the hundreds of thousands per month. Although the hand-spray methods previously used were quite efficient, increased demands made it necessary to step up production.

The big problem was that of adding more men to a setup where floor space was already at a premium. Laboratory tests proved that dip painting and electrostatic detearing would be most practical and economical for this particular variety of products. After evaluating the problem, the decision was made to convert to an automatic dip-painting setup using conveyorized equipment.

Fixture spacing and the number of parts per work hanger vary according to the size and shape of the parts being painted. Directional light handles are loaded 15 to a hanger, with hangers on 18-in. centers. After dipping in black baking enamel, the parts pass over a drain board, then over the electrostatic detearing grid. Detearing time is about 1½ min.

Following detearing, painted articles move through a gas-fired oven for 20 min. The parts then move along to the loading and unloading station where they are removed and packed for shipping.

Rejects formerly ran as high as 7 to 8 pct. Since the new setup has been installed, rejects have been running less than 1 pct. In addition, quality of the finish has been improved, savings in labor are about 50 pct, production has increased, and savings in material usage are substantial. The same amount of work which formerly required five drums of paint is now done with two drums of paint.

Viscosity controlled easily

The size of an article has no appreciable effect on detearing action. Also, detearing force is not effective on parts other than at the drain points. Thus, detearing does not necessarily shorten the drain time except in some cases where secondary flow can be speeded by detearing the initial flow.

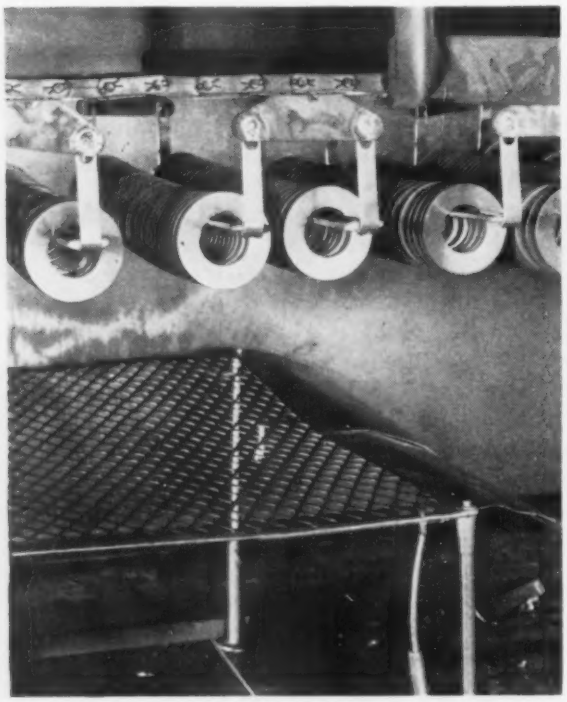
Detearing is effective on large articles. A good example is multiple detearing of reels for the Signal Corps by Arvin Industries, Inc., Columbus, Ind. These reels must withstand rugged service in battlefield use. In addition to anti-corrosion requirements, they must pass a drop test which is equivalent to tossing the reels from a Jeep onto frozen ground.

The steel reels are first given a phosphate coating and a zinc chromate primer, after which they pass over a detearing grid for about 15 sec. They are then air dried in ovens before being dipped in enamel. After enameling, the reels pass over a large detearing grid for 25 sec where practically all excess paint from the initial drain is removed. Just before the reels enter gas-fired, infra-red ovens, they pass over a smaller detearing unit which whisks away any remaining tear drops. Without the second detearing operation, the draining period would be quite long due to the complex design of the reels.

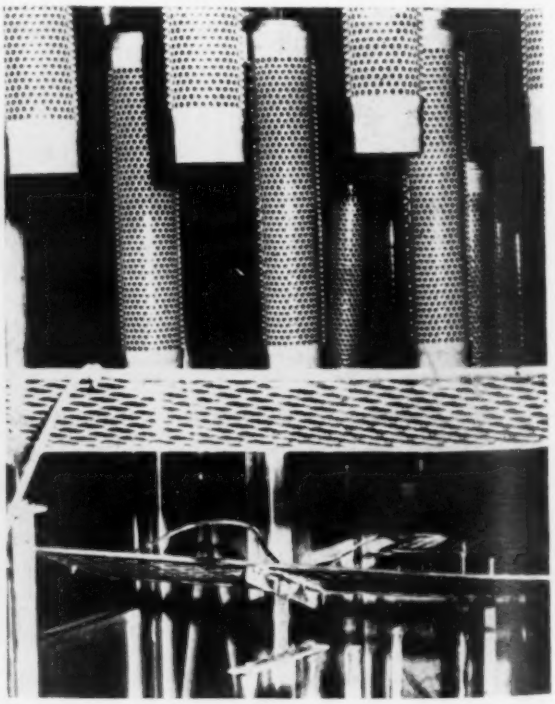
Ease of control is another important benefit of electrostatic detearing. Without detearing, frequent viscosity checks and adjustments must be made to keep the coating material in proper balance. Usually, this range is narrow since it must satisfy two opposing factors. First, the coating material must be heavy enough for satisfactory film thickness at the upper areas of the workpiece. Secondly, it must be thin enough to keep buildup at the drain point to a minimum.

With detearing, the coating operation is no longer critical. Actually, coating materials of heavier viscosity may be used in most cases. As a result, the heavier film possible on top edges provides a better and more uniform finish. This is one reason why dip painting can now be used where previously only spray methods would suffice.

Servel, Inc., Evansville, Ind., is using the detearing process for finishing 105-mm type M-32 cartridge cases. These are about 2 ft long and having 1488 perforations in each. Detearing has been very effective for this job as evidenced by



SPRINGS for anti-tank mines pass over detearing grid at the rate of 3750 per hr. About 2 gal of paint can coat 8000 pieces.



ELECTROSTATIC GRID whisks paint tears from 105-mm shell cases and produces uniform finish. Rejects were cut to less than 1 pct.

the low number of rejects. Despite rigid inspection, rejects for all reasons are less than 1 pct. Detearing is also used by this firm in finishing refrigerators.

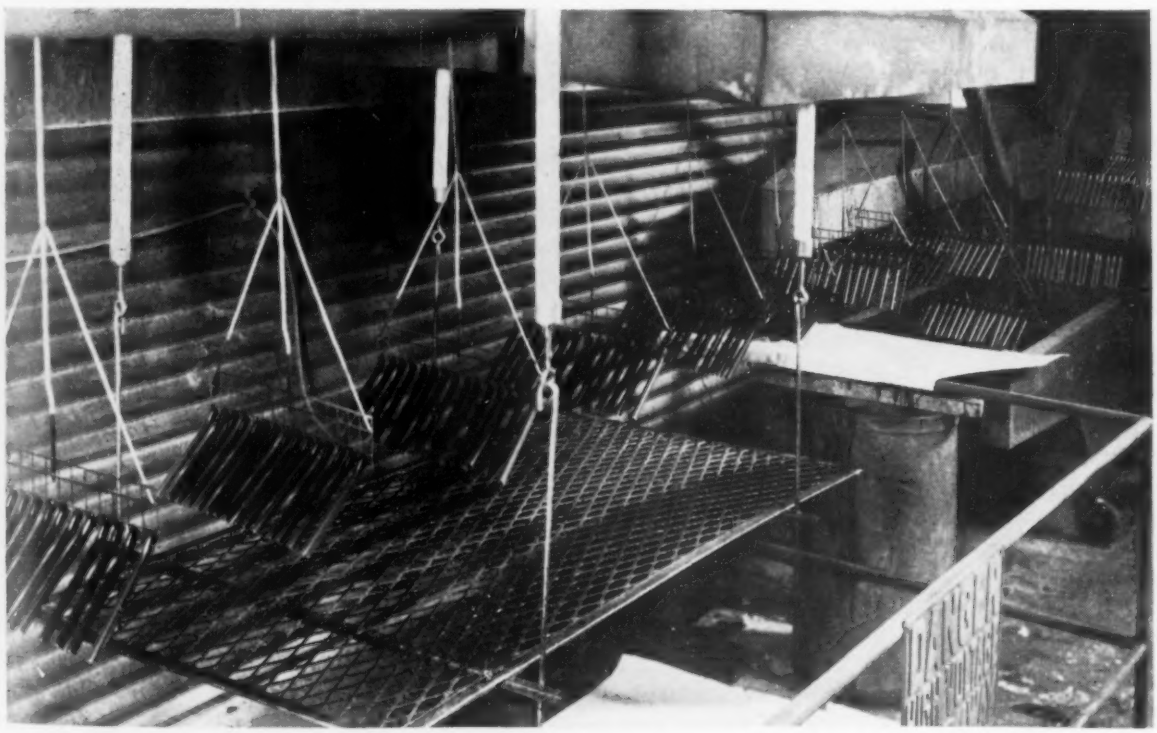
The Muehlhausen Spring Div. of Rockwell Spring & Axle Co., Logansport, Ind., also uses detearing on government work, but for another reason. In making Belleville springs for antitank mines, specifications call for a coating of oven-dried enamel having a film thickness of 0.75 to 1 mil. If paint tears are not removed after the dip painting operation, the coating would not bake through, or would become brittle and form a spot susceptible to corrosion. Two coats of enamel are applied after which the springs must withstand a 250-hr salt spray test.

Paint mileage increased

The conveyor system for handling the springs was custom-built by Muehlhausen. The finishing system includes the dip tank, detearing unit and a gas-fired oven. The entire operation is handled by four operators—one to load and unload the line and three helpers to load the fixtures. Springs are loaded in double rows of 40 each to a fixture. Fixtures are spaced on 14-in. centers. After dipping, parts drain for 4 min and are deteared in 40 sec. Baking time is about 20 min at a maximum temperature of 450°F.

Every other workholder on the conveyor is painted yellow. After springs complete a cycle on the unpainted holder, they are moved into a yellow holder for the second coating. After the second cycle, finished springs are removed and packed for shipping. With this setup, average production is 3750 pieces per hr. As for paint mileage, about 8000 pieces require only 2 gal of mixed paint.

MULTIPLE DETEARING solved problem of long drain period on reels for Signal Corps. Prime and finish coats are deteared in less than 1 min.



COMPACT SETUP dips and detears automotive parts which were previously hand sprayed. Less floor space is required and production is higher. Rejects have been cut by 6 to 7 pct.

Flatness counts—

Get More From Your SURFACE PLATES

By John Hyler
Consultant

◆ Demands for greater accuracy in all metalworking operations have made the surface plate a widely used shop tool . . . For gaging, checking, and especially for layout work on small lots of parts where tooling is not economically practical, the surface plate is an invaluable aid.

◆ Here are ideas on how to get the most from your investment in metal and granite surface plates . . . Make your selection with specific jobs in mind . . . Proper care can extend surface plate usefulness, help maintain its accuracy over a longer period.

◆ DEMANDS for accuracy have made the surface plate a must for many inspection and checking operations. Plants are using more surface plates in more sizes, often for special needs. Careful selection and handling of surface plates can increase useful service life and promote greater accuracy in shop operations.

Two materials are generally used for surface plates—cast iron, and granite. A few firms have tried glass for plates. Cast iron surface plates for gage inspection should be flat within 0.0003 in. between any two points not more than 18 in. apart, according to government specifications. Difference between adjacent high and low spots should not exceed 0.0002 in. Scraping on a cast iron surface plate should leave at least 15 high points per square inch.

Granite surface plates, to meet government specifications, should be accurate to 0.0001 in. over the total area. It is important to recheck all surface plates periodically for wear.

Surfaces of granite plates can be held to very close limits of accuracy. Any error from absolute flat is generally preferred on the convex rather than concave side. The center portion of a surface plate receives the greatest wear. When any existing error is convex, wear is in the direction of correction during early life of the plate.

Metal surface plates are available in a wide range of 6 x 12 ft and 8 x 10 ft and in a variety of cast irons including Meehanite. One of the largest granite surface plates made has a surface 96 x 192 in., and weighs 25 tons. Another is 20 ft long, 6 ft wide and 3 ft thick and weighing 30 tons.

Some surface plates have 3-point support for easy leveling. A wide flange around one or more edges of a surface plate permits use of clamps. In some cases it is desirable to locate two pieces on a surface plate at a specific angle to each other. For this purpose a metal surface plate is often scribed with lines crossing at right angles on relatively close centers. Other types of scribing can be provided. In some instances, a keyway on the top surface or along one edge of a plate is useful.

Cast-iron plates should be protected by setting all pieces on the plate gently, making sure all burrs are first removed. Do not place balls or small cylinders directly on a surface plate. These objects have a small area of contact and are more

MR. HYLER'S broad knowledge of manufacturing problems is based on more than 20 years of practical shop experience. His studies and research have given him a wide knowledge of everyday problems in shop operation.

ROUGH PLANING large metal surface plate at the Milwaukee plant of J. C. Busch Co.

apt to wear a surface plate due to high unit pressure.

A turntable is often used to avoid walking around the bench when using a surface plate. Two hardwood maple blocks bolted at center and lightly dressed with machine oil to reduce friction, make an excellent turntable.

Cleanliness is important. Dust and dirt collect rapidly. Surface scratches may be avoided by keeping the surface clean. A plywood or similar cover should be kept over a plate not in use.

Where metal plates gather dirt or corrode, they should be polished from time to time with a fine emery cloth, held beneath a perfectly-flat block of steel. Where a metal surface plate may be subject to moisture it should be protected with machine oil thinned with kerosene.

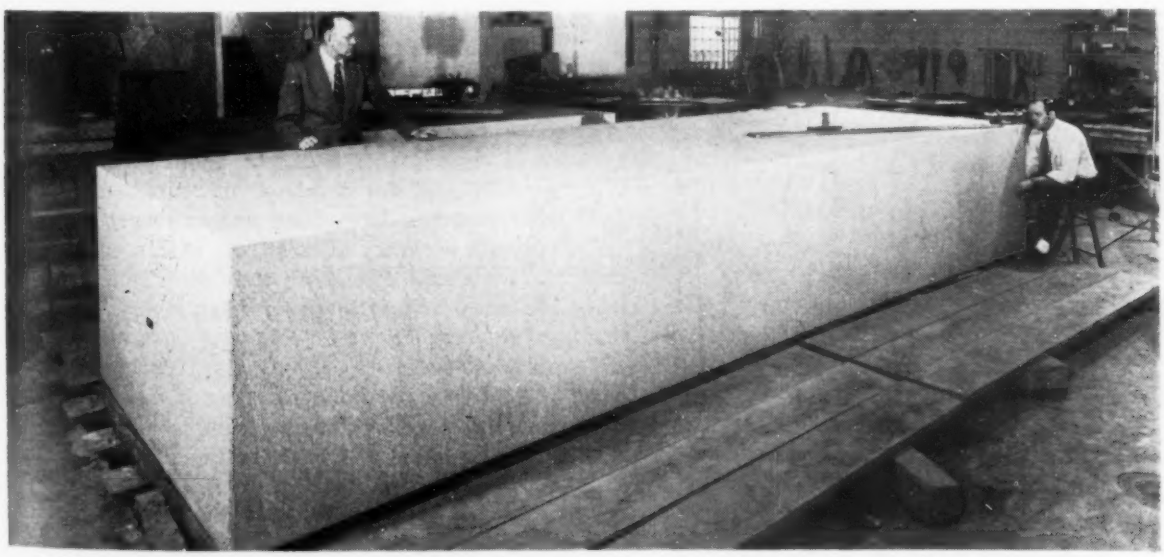
To minimize scratching, slide a heavy piece onto the surface from the edge. Heavy or rough pieces may be mounted on parallels or wood blocks. These protect the surface and simplify leveling without shimming at the surface plate.

Metal surface plates are subject to peening. When a nick is formed in the top by dropping something on it, a portion of metal displaced from the nick is raised above the normal surface of the plate. A very fine-toothed file held perfectly flat can be used to cut the raised metal back flush with the surface.

Portable and stationary stands are available for both metal surface plates and the smaller-area granite plates. Stationary stands usually have leveling screws under the legs. Where highly accurate leveling is important, the stationary stand is more easily leveled.

Standard height for a surface plate mounted on a stand is 30 in. from floor to plate surface. Stands of more recent design often have built-in storage areas for gages.

Where a surface plate of considerable size is



THIRTY-TON granite surface plate is 20 ft long, 6 ft wide, 3 ft thick. Overall accuracy of surface is 0.0015 in. Every 2-ft square section is accurate to within 0.00005 in.

to be installed permanently a concrete base independent of the shop floor, is desirable. The base should have sufficient independent footing to be relatively unaffected by vibration and settling of the building.

The surface plate should be leveled with considerable care when first installed. Thereafter it should be tested for level every week or two for several weeks, and beyond that once or twice a year.

Where plates and stands do not incorporate built in leveling screws, leveling jacks can be used. Some jacks incorporate vibration-absorbing mounting pads, particularly useful beneath heavy surface plates. Some wedge type jacks are self-aligning to uneven floors. Where anchor bolts are used one leveling jack assembly provides an anchor bolt hole directly through the assembly, for a ¾-in. diam bolt. This unit has a vibration absorbent washer, and mounting pad. Each jack easily lifts 8000 lb. An adjusting screw raises or lowers the load at any point.

Regular use of a surface plate for layout is advantageous for small lots where tooling is not economically feasible. An increasing volume of weldments, castings and other parts requiring layout is being routed through machining operations by way of the surface plate. This is a logical point for primary inspection to determine whether parts can be properly machined as they stand. Sometimes, a casting or a weldment may require straightening prior to machining. In other cases, insufficient metal is available for machining. Such parts can be set aside and marked for metal addition by the welding or spray-gun method.

Location of the surface plate should be selected carefully. While surface plates should be located with minimum parts handling in mind parts should also be as far removed as practical from vibrating machinery. Metal surface plates should be protected from extremes in temperature variations.

ANGLE OF GRAIN in this granite surface plate is 45° to working surface to reduce chipping.

Where large metal plates are to be installed in multiple, to use their combined surface areas, keyways are usually machined in the sides of the plates to be joined. Keyway cuts are gaged from the surface. Keys, in mating keyways, insure that surfaces of two plates will be flush. One plate should be completely installed and leveled before beginning the second.

Only a small portion of work coming to surface plates in a plant calls for the highest degree of accuracy. One firm, instead of rescraping metal surface plates as they wear, downgrades the metal plates. Plates are classified as A, B, or C, according to condition of wear. Granite surface plates are used for replacements.

Free from warpage

Pink granite, with 76 pct quartz, has slightly greater hardness and wearability than gray granite with 70 pct quartz. Black granite is used for surface plates, straight edges, angle plates and parallels. Oil or dirt smudges are easily noticed on the black diabase surface, and the surface is easily cleaned.

Granite in general is completely free from warpage. There are no internal stresses and the material will not warp either from shock or change of temperature. Since it contains no metal, no oiling or polishing is required. There is no peening action when a sharp object drops on a granite surface plate. Whatever material is displaced from the nick will be in the form of powder, which can readily be brushed away.

The surface of a granite plate is sufficiently hard that abrasives cannot become embedded in it, with resultant lapping of either products or tools. Yet, its porous structure prevents seizure action, and workpieces or instruments are not wrung tight to the surface. Instruments move smoothly and easily over its surface.

T slot aids clamping

For large, unwieldly work, such as machine tool ways, planer beds, etc., stone straight edges are favored for precision measurement because they are free from distortion and warpage. Some provide accuracy of 0.0001 in. within every 36 in. Stone straight edges to 60 in. long equipped with handles for positioning are available.

Nonmagnetic properties of granite surface plates have made them popular. Parts previously held on magnetic chucks do not have to be demagnetized prior to inspection.

A T slot in a surface plate facilitates clamping operations. Bench centers, index centers for radial layout, and other inspection equipment may be used more readily. T bar surface plates of granite are made by milling a metal T bar and positioning it in the granite.

The A. O. Smith *Champion* Heavy-Duty A. C. Welder

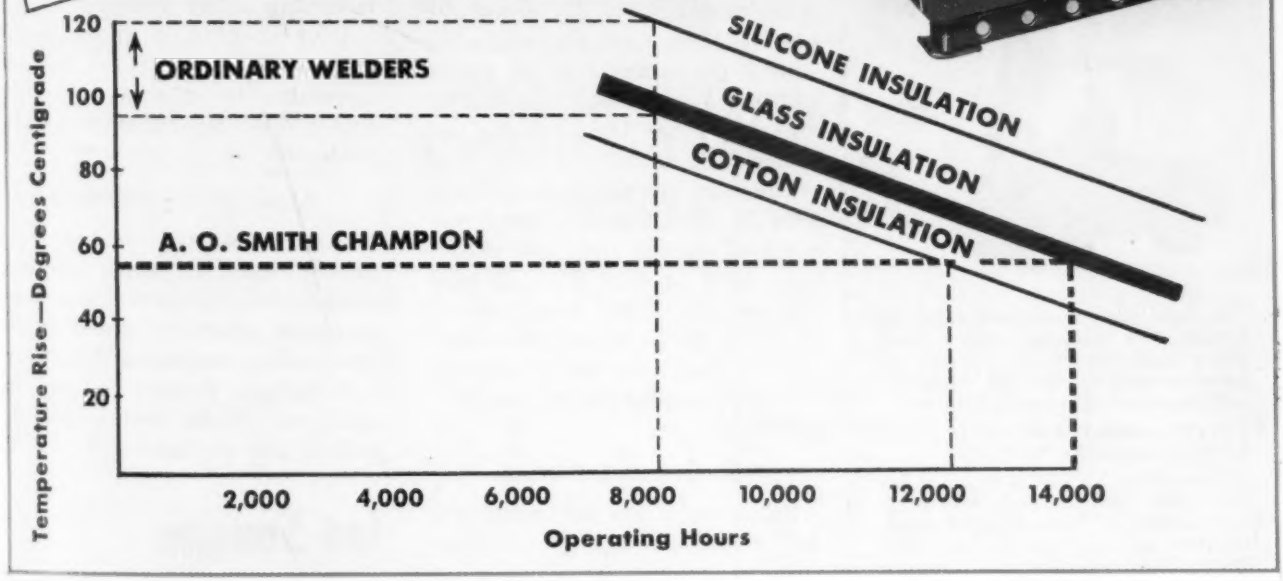
6000 hours longer life

than any other A. C. welder

Available in 300-, 400-, and 500-Amp. models.

PROOF

LIFE EXPECTANCY CHART



Temperature Rise Determines Machine Life

According to the Insulation and Aging versus Temperature Curves, as published by the A.I.E.E. . . . *the cooler a welding machine operates, the longer its production life.*

The A. O. Smith Champion is the *only* A. C. welder on the market with enough copper and cooling capacity to operate without exceeding a 55° C. temperature rise—as compared to the 90° C. rise allowed by N.E.M.A. for glass-insulated welders.

This means: The Champion will give you top production efficiency almost twice as long as any other A. C. welder on the market today.

Built for those who want the best in welding, the Champion has a full 75 open circuit volts, high-velocity down-draft ventilation, all-weather case, 12½ KVA power factor correction and stepless current control.

For additional information on welding machines, electrodes and accessories, see your local A. O. Smith distributor or write to A. O. Smith Corporation, Welding Products Division, Milwaukee 1, Wisconsin.

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Technical Briefs

Engineering

Freezer:

High capacity, portability features of new unit.

Rapid pull-down and high capacity for handling of aluminum alloys in heat and cold treating processes have been built into industrial freezers recently installed at Boeing Airplane Co., Seattle. The units were built by Webber Mfg. Co., Inc., of Indianapolis, Ind.

These low temperature units were designed for the rapid removal of heat from aluminum alloy materials after heat treatment quenching and for the cold storage of aluminum alloy materials for prevention of age hardening.

Automatic Control

Temperature requirements on these models were for automatic controlling and maintaining —40°F temperature at all points within the cold compartment at all times in room temperatures approximating 90°F.

The units are designed to reduce 1000 lb of aluminum alloy material of various sizes and shapes from 65°F to —10°F in 20 minutes or less. Rapid heat removal and even temperatures are maintained through the use of a blower circulator serving the storage compartment.

Self-contained, Portable

These units are self-contained and portable for lifting and transporting by fork lift truck. Inside storage compartment is a free opening 36 in. wide, 36 in. deep and 168 in. long. Overall cabinet dimensions are 84 in. wide, 72 in. high and 240 in. long. Approximate weight is 9000 lb.

Access to the cold compartment is through three gasket sealing doors each 36 x 56 in. Automatic opening and closing of the doors, singly or together, features interlocking safety devices.

Door opening is automatically delayed 30 seconds for the air circulator to stop and the air within the compartment to become quiescent.

Light Warns Operator

Other features include red flasher light to warn operator when interior temperature is above maximum allowable, water cooled condensers, automatic defrosting and various devices to conform to local safety codes. Similar models are available to —185°F.

Quick freeze for alloys . . .

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 115. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Ion Source:

Mass spectograph used to obtain isotopes.

Separation of usable quantities of isotopes of ruthenium, palladium, iridium and platinum have been made possible through use of a mass spectrograph at Oak Ridge National Laboratory, Oak Ridge, Tenn. The laboratory is operated by Union Carbide & Carbon Corp. for the Atomic Energy Commission.

The ion source, developed by

staff members of the Laboratory's Stable Isotope Research and Production Div., operates at temperatures from approximately 3800° to 5070° F.

Bombarded

These temperatures are obtained as the result of electron bombardment of the graphite oven containing one of the above elements in the form of the metal. It is necessary to use the element itself because all investigated compounds of ruthenium, palladium, iridium, and platinum decompose on heating.

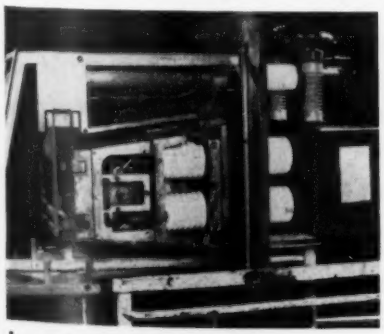
Ion beams as high as 30 milliamperes were measured at the isotope collector pockets. After chemical purification, these enriched isotopes will be made available for research in laboratories of the Commission, and for industrial and university laboratories.

In the table the percentage of each of the known stable isotopes of these elements occurring in the natural form is given.

ISOTOPE PERCENTAGE

Ruthenium		Palladium	
Mass	Abundance, Pct	Mass	Abundance, Pct
96	5.7	102	0.8
98	2.2	104	9.3
99	12.8	105	22.6
100	12.7	106	27.2
101	17.0	108	26.8
102	31.3	110	13.5
104	18.3		

Iridium		Platinum	
Mass	Abundance, Pct	Mass	Abundance, Pct
191	38.5	190	0.1
193	61.5	192	0.8
		194	32.8
		195	33.7
		196	25.4
		198	7.2



Ions from calutron . . .

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Oxygen:

Canadian unit produces in volume for flash smelting.

A tonnage oxygen unit for production of the vast quantities of oxygen required for the direct flash smelting of copper concentrates has been placed in operation here by The International Nickel Company of Canada, Limited.

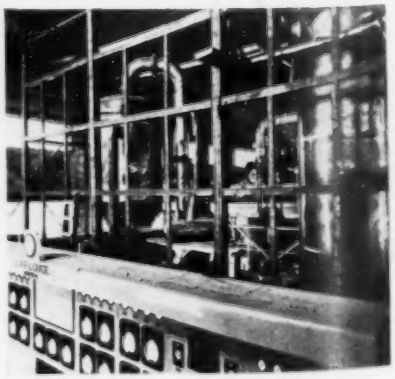
Inco's new oxygen flash smelting process eliminates the fuel normally required for smelting and makes economical the present large-scale output by Canadian Industries Ltd. of liquid sulfur-dioxide from furnace exhaust gases.

High Daily Volume

Operations call for more than 7.5 million cu ft of oxygen every day—enough to fill 32,000 standard cylinders. The company's oxygen plant produces 300 tons of 95 pct pure oxygen every 24 hours.

The oxygen plant, designed and built by Canadian Liquid Air Co., Ltd., and known as an "Oxyton," separates the oxygen from atmospheric air by the liquefaction process.

Plant makes oxygen . . .



Liquefaction equipment . . .

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Drying:

Large porcelain enamel sheet dries by conduction.

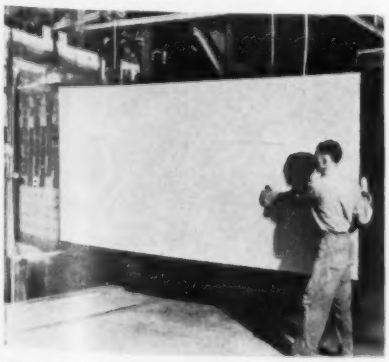
Swelling the list of industrial uses for porcelain enamel is a large coated metal sheet used as a major component of a drying unit. Made by Barrows Porcelain Enamel Co., of Cincinnati, it will be the surface of the Proctor Secotherm—a hot plate drying unit manufactured by Proctor & Schwartz, Inc., Philadelphia, to dry pasted side leather, calf, goat, and sheep skins.

Measuring nearly 6 x 12 ft, the big sheets are used to form the working surfaces on both sides of the drying unit. Held to these surfaces by adhesives, the hides are dried by conducted heat from a hot water bath heated by steam inside the panel.

Drying Time Cut

After the drying operation, which with this system is reduced to 15 to 20 minutes (it formerly required several hours), the hides are removed, the adhesives washed and scrubbed off, and the cycle repeated.

Porcelain enamel was selected as the surface for this drying unit because it aids in imparting a smooth finish to the hides and will rapidly conduct heat from the hot water. This is important for, with this system, rapid evaporation and uniform drying is effected by conducted heat, rather than by the slower conventional method of convected heat from circulated air. The slick surface also eases the job of stripping the hides and rolls the water away.



Porcelain enameled . . .

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—Technical Briefs—

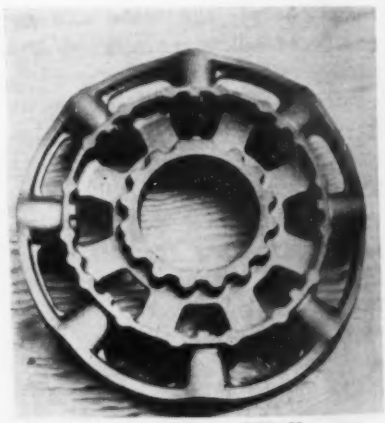
Shell Molding

Stainless steel jet engine rings cast in shells.

Stainless steel support rings for a powerful jet engine are cast in thin shell molds bonded with phenolic resins to meet rigid standards of perfection. The slightest imperfection in the support ring, which is checked internally by X-ray, can cause this vital part to fail under the high vibrational stress of a modern jet engine.

Porosity of the shell molds and freedom from shrinkage of the metal during cooling produces a high percentage of sound castings. Tolerances of 0.002 to 0.003 in. with the shell molding process which Bakelite Co. Div. of Union Carbide and Carbon Corp. has helped develop.

The fine tolerances make it possible to cast closer to size, reducing both the amount of metal used and the finishing costs. According



Stainless ring, 37 lb . . .

Making the shell . . .

to The Copper Alloy Foundry Co., Hillside, N. J., the support rings could not be cast to the required perfection using conventional sand molding methods.

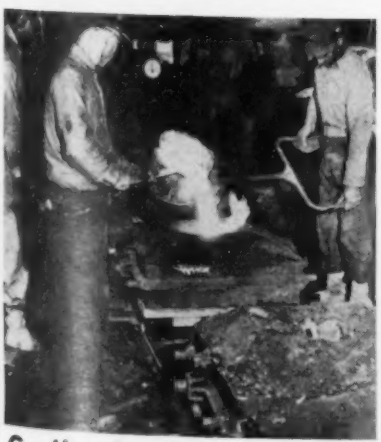
Two halves of the mold can be produced in quantity by automatic machinery at different times and stored for future use. This permits greater flexibility in foundry operation than conventional sand molds which must be cast soon after they are made.

Forms Thin Layer

A mixture of sand and phenolic resin forms a thin layer on a heated pattern of the object to be cast. More heat cures the resin which bonds the grains of sand together to form a thin, lightweight mold. The molds can be stored in comparatively small space until needed.

Excellent castings have been made from test molds stored as long as 2 years. Before casting, the two mold halves are bolted together and laid flat.

Stored shell molds . . .



Casting is poured . . .

Turn Page

Handling:

Trailability sets trailer-train aisle widths.

A major factor determining minimum aisle widths for an in-plant tractor-trailer system is ability of the train of trailers to approximate the initial path of the tractor. This trailability depends mainly upon the relative positions of the fixed wheels of the trailer and the articulate points of the couplers.

Three commonly used types of industrial trailers are the caster-wheel steer trailer, the fifth-wheel steer trailer, and the four-wheel steer trailer.

Platform On Wheels

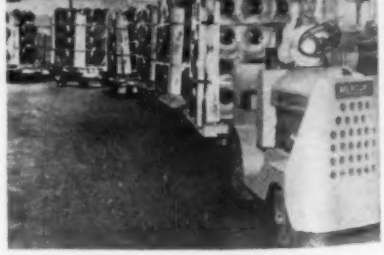
The caster-wheel steer trailer consists of a platform mounted on four wheels. Its front wheels are mounted in swivel caster assemblies. Rear wheels, mounted on a fixed axle, are usually larger than the caster wheels. They carry the bulk of the load.

Caster-wheel steer trailers are moved easily by hand and can be turned in very confined spaces. In addition, a train made up of these trailers will trail accurately. For all-purpose work, the caster-wheel trailer gives good results.

For Heavy Loads

The fifth-wheel steer type, generally has four equal-sized wheels. Its front steering wheels are attached to the platform by a wagon-type fifth wheel. These trailers are well suited for heavy loads and the hardest of service.

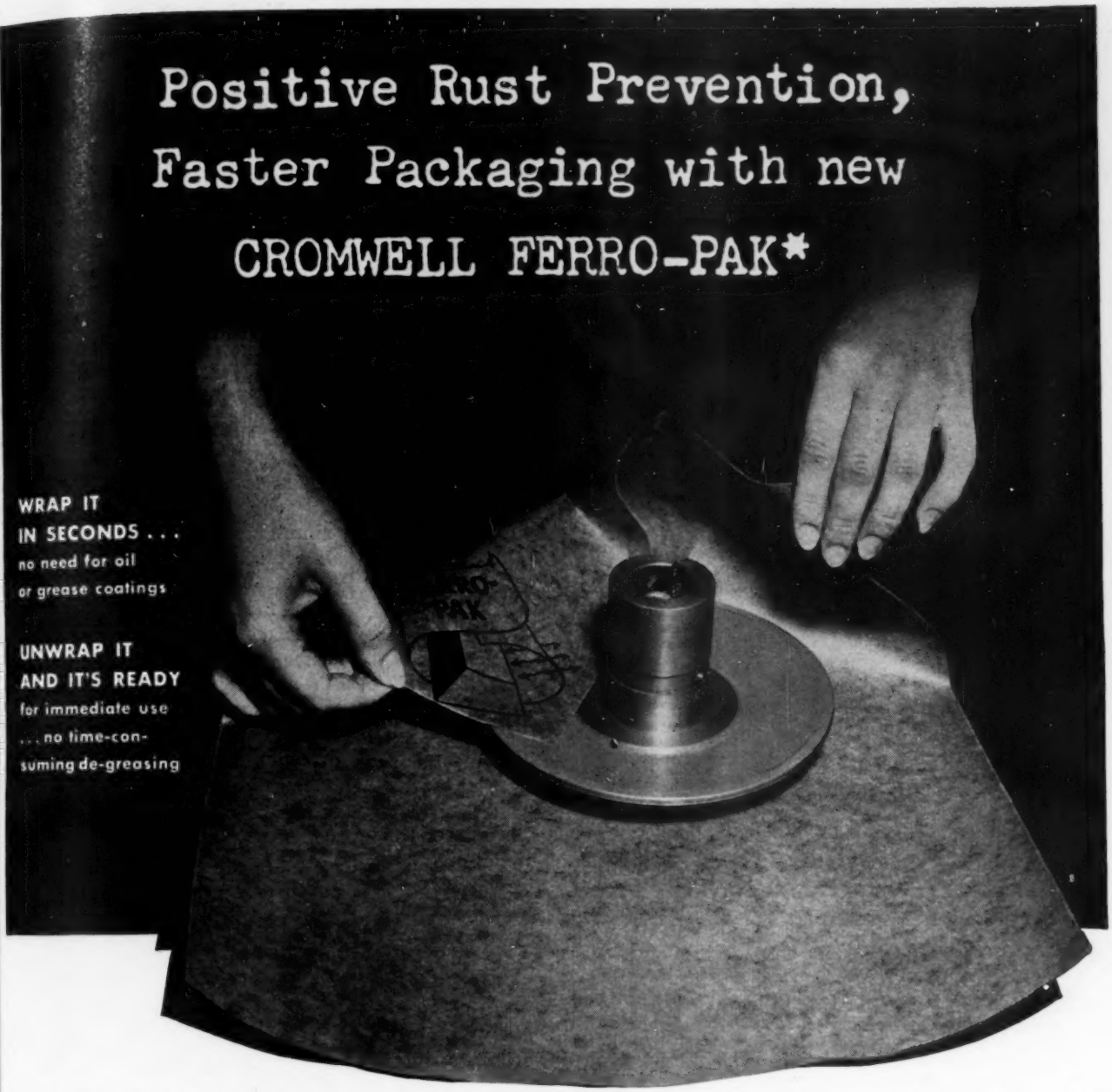
However, a train of these trailers will not trail as accurately as a train of caster-wheel trailers and



This train needs room . . .

Turn Page

Positive Rust Prevention, Faster Packaging with new CROMWELL FERRO-PAK*



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Four wheel steer trailers are excellent for accurate trailing . . .

is not reversible. In addition, fifth-wheel steer trailers are hard to turn by hand in confined places. They are difficult to back up with a tractor because double pivot points are involved. A special application of the fifth-wheel steering mechanism to both ends of the trailer (double fifth-wheel) makes this type trailer reversible.

An Adaptation

The four-wheel steer trailer has all four wheels arranged to steer simultaneously. This type trailer is often a further adaptation of a double fifth-wheel type, namely, two fifth-wheel steering assemblies connected by cross bars. In some designs four wheel steering is accomplished through use of knuckle mounted wheels.

Four-wheel steer trailers are excellent where accurate trailing is absolutely essential. However, they are difficult to maneuver by hand and need much turn space.

Determines Trailability

The relative positions of the fixed wheels and the articulate points of the couplers determine the ability of the trailer to approximate the initial path of the tractor. An analysis of the steering action of the caster-wheel trailer, as a typical consideration, will illustrate the relationship between wheel position and trailability.

If the fixed wheels of a hypothetical caster-wheel trailer are midway between the coupler joints, every articulate point will follow the turning arc path and always be equi distant from the theoretical vertical axis running through the middle of the fixed axle.

Cause of Whip

In theory, a trailer constructed in this manner will trail perfectly. However, a trailer with its fixed axle in the middle is susceptible to whipping actions caused by the normal side motions of the tractor.

This tendency to whip is easily understood by considering the trailer as a lever pivoted at its mid-

dle and taking alternate thrusts at its front end from right to left.

Any force transmitted by the tractor to the front coupler of the trailer will be transmitted in equal magnitude by the rear coupler to the next trailer. In other words, there is a one-to-one ratio between the two forces because their lever-arm distance is equal.

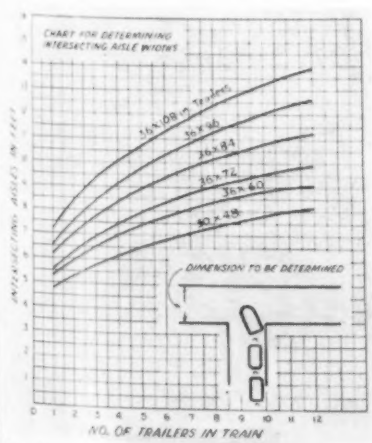
Moving the fixed wheels forward tends to magnify the transmitted forces. Side motion transmitted from the tractor to the front trailer coupler would be transmitted by the rear trailer coupler to the next trailer and magnified by the ratio of the rear lever distance to the front lever distance of the trailer.

Counteracting Whipping

The ideal solution—one that will inhibit rather than induce whipping—would be to move the fixed axle rearward so that any transmitted side motion would be diminished rather than magnified.

Unfortunately, any gain in the trailer's ability to counteract whipping is accomplished at the expense of trailability. Because the centerline of the fixed axle no longer passes through the center point of the turning arc, the train made up of trailers whose fixed axles are located to the rear of the center of the platform will not follow the curve accurately.

These trailers cut in a trifle as they trail and have separate paths and separate pivot points. Thus, the turning path, formerly a circle now resembles a parabola, and the pivot point is now an instantaneous center.



It figures this way . . .

Turn Page

How YOU can give the GO -signal

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Remember, the longer the train, the wider the aisle width must be . . .

With this constant trailing error or deviation, the extra aisle width needed for turning is further determined by the number of trailers in the train—the longer the train, the wider must be the aisle dimensions.

Train Determines Aisle

A train of five to six trailers has been found to offer optimum load-carrying capacities without requiring uneconomically large aisle widths. In addition, aisle and corridors are not seriously tied up as they would be if 20 to 25 trailers are used (as in some railroad warehouse installations).

Experience has shown that reasonably accurate trailing without whipping can be achieved if the fixed wheels are located approximately one-third of the deck length from the rear of the trailer.

Gradability and Stability

Location of the free-swiveling casters has no bearing on the trailing of the vehicle and little or no effect on the whipping.

Their location does affect the gradability and stability of the trailer. If the king pins of the swivel casters are located approximately one-sixth of the deck length from the front of the trailer, gradability and stability will be good.

With the fixed and caster wheels in the position indicated, the rear wheels will carry approximately two-thirds of the load while the caster wheels will carry the remaining one-third. This is one of the reasons why the caster wheels are smaller than the fixed wheels.

Design Compromise

The one-third and one-sixth deck-length proportions are easily maintained on trailers up to 9 ft in length. For longer trailers, these proportions are necessarily deviated from to favor grade clearance and to avoid highly-concentrated frame stresses. Stake pocket interference and special trailer applications are other reasons for

Turn Page

deviating from the optimum proportions.

Because industrial trailers are designed to effect a compromise between trailability and whipping, their turning points—instantaneous centers with constantly-changing paths—are difficult to lay out on paper.

Tests run on actual equipment, or scale models, offer the quickest, easiest and most accurate methods for determining tracking paths and aisle-width dimensions.

Maximum Width

Beyond a certain number of trailers, aisle-width dimensions for all practical purposes remain the same. For example, the results of this test showed that an overall dimension of 21½ ft is sufficient for any number of trailers.

After a certain number of trailer turns, the maximum turning angle of the trailer couplers is reached and the remaining vehicles in the train—instead of following a constantly-deviating path — now follow a relatively fixed path.

Drilling:

Truck axle king pin, spring seat holes drilled.

King pin and spring seat holes are being drilled automatically in truck I beam front axles with a new machine designed to reduce handling and increase efficiency in production of I beams. The machine, designed by Modern Tool Works, Ltd., Toronto, is being used by Hayes Steel Products, Ltd., Canadian Truck Manufacturer.

Certain critical relationships must be maintained between king pin holes and the holes in the spring seat pads for center bolts and spring U bolts in I beam front axles.

Warpage a Problem

King pin holes and the spring seat holes must be located symmetrically about the center line of the axles. At the same time the king pin holes must be drilled in the center of the bosses provided on the ends of the forgings.

Since forgings, after straighten-

ing, may vary as much as ¼ in. between centers of bosses, there is a compensation problem when all holes are drilled simultaneously.

To maintain king pin holes in the center of bosses regardless of the distance between the bosses, the machine automatically adjusts drilling spindles to suit the forging.

At the same time the forging is centralized to the spindles which drill the spring seat pads.

Gears in Base

Spindle speed in the hydraulic feed units is controlled by pick-off gear change. Pick-off gears for all required spindle speeds for this machine are housed in the base of the machine.

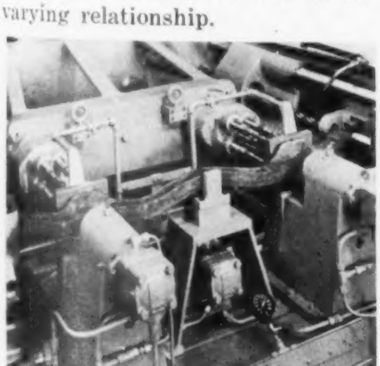
Normal operation involves the following sequence:

1. Load forging into machine (using overhead hoist).
2. Push button to actuate automatic hydraulic clamping cycle.
3. Manually engage thrust supports to back up king pin bosses against distortion during drilling.
4. Start automatic drilling cycle.
5. Disengage hydraulic clamps and manually retract king pin boss thrust supports.
6. Remove finished axle from machine by hoist and reload.

The machine produces finished drilled axles at the rate of 32 per hour at 80 pct efficiency.

Positions Forging

The compensating device which positions the axle forging centrally and adjusts the drilling spindles for king pin holes consists of two movable assemblies which carry the drilling spindles, spindle slides, drill bushings, thrust support blocks and V block locators in unvarying relationship.



Drills axle forgings . . .
Turn Page

Mining:

Heavier loads hauled by powerful locomotive.

What is believed to be one of the world's largest and most powerful underground locomotive is in operation at Finleyville, Pa. at the Mathies Coal Co.'s mine. Extra heavy coal loads can be handled by the single unit engine.

The single-unit giant was built by the General Electric Co. Locomotive and Car Equipment Dept., Erie, Pa.

With a rated drawbar pull of 25,000 lb, the locomotive is capable of pulling 1600 tons (equivalent to approximately 110 loaded mine cars) on a straight, level track, or 454 tons on a 2.2 pct grade.

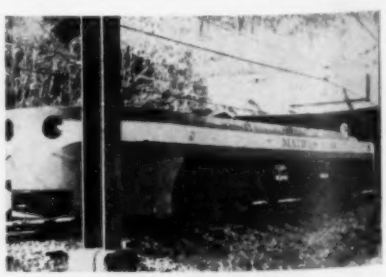
Has 600 hp, Weighs 50 Tons

Because of the grades in the mine, the unit normally will pull approximately 32 loaded cars at the mine. The special high-speed, high-weight haulage locomotive is rated at 600 hp and weighs 50 tons. It is 35 ft long and has four 150 hp motors, one on each axle.

Designed specifically to haul more tonnage faster, it will be used on the mine's main line track to haul coal from an underground gathering point to the cleaning plant located on the Monongahela River just down-river from Monongahela.

Coal can then be either loaded into barges or railroad cars or delivered by belt to the Mitchell Power Station of the West Penn Power Co.

The mine is owned jointly by National Steel Corp., Youngstown Sheet & Tube Co., Steel Co. of Canada, and Pittsburgh Consolidation Coal Co.



Big mine locomotive . . .

Heat Treating:

Furnace on scaffold solves unusual plant problem.

Putting an atmosphere hardening furnace on a scaffold helped Auto Specialties Mfg. Co., St. Joseph, Mich., meet an unusual problem.

This large manufacturer of parts used in automobiles and tractors, was faced with a special problem of positioning a Lindberg electric conveyor atmosphere hardening furnace.

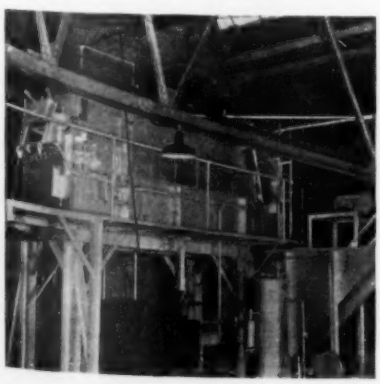
Water In Pit

Since plant is located on sandy soil just off the shores of Lake Michigan, water would be encountered if a pit was dug for the quench tank. In addition, mobility was desired to allow for subsequent repositioning of the unit if the need arose.

Their solution was to place the 17,400 lb furnace on a scaffold. Large containers holding the work to be treated are hoisted to the loading platform by a lift truck where the operator shovels it into the furnace.

Drops to Quench Tank

After treatment, work drops from the conveyor belt into the quench tank where a flight conveyor drops it into a steel chute leading to tempering baskets. This solution also lends itself to space savings since atmosphere generators, control panels, etc., can be placed under the scaffold.



Furnace on stilts . . .

Turn Page

Gear Shaver:

Two-gear clusters handled rapidly, accurately.

Production shaving of a two-gear cluster for farm tractor transmissions poses a machine requirement of high production and flexibility. The same machine is used to finish both gears in the cluster and it must be capable of performing the shaving operation to the required accuracy with a minimum time loss for changeover.

To attain a production rate of about 240 gears per hour a Model 870 underpass gear finisher built by Michigan Tool Co., Detroit, Mich., is automation equipped. The only operator attention required is putting parts into the loader.

An automatic sizing fixture at the entry end of the loader prevents the loading of oversize parts, so that only gears that are within size limits for shaving pass through. This results in faster shaving and more accurate gears as well as giving maximum cutter life.

Since one of the gears in the cluster has 23 teeth with a 14 normal pitch and a 1.6429-in. pitch diameter and the second has 28 teeth with a 14 normal pitch and a 2-in. pitch diameter the machine set up is changed for each shaving operation.

Quick Changeover

Only three steps are required in the changeover and are accomplished in a few minutes.

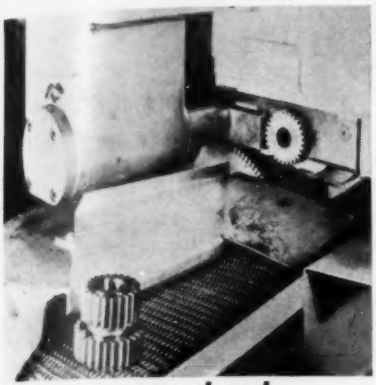
1. Center distance is changed by means of a handwheel.
2. Sizing fixture is changed by removing four bolts.
3. Subplate, mounting the head and tailstocks and the loader, is positioned by lining up locating markers (visible at front of machine).

Gear Pushed In

A cylinder pushes the gear to be shaved into a round carrier with a diameter equal to that of the larger gear. When a limit switch is tripped on retraction of the cylinder, a second cylinder at the back of the machine pulls the gear into shaving position.

An arbor then moves into position and holds the gear for the shaving operation. Movement of the arbor into position causes a

Gear shaver at work . . .



Parts conveyed out . . .

limit switch to be tripped, starting the underpass shaving cycle.

Arbor Retracts

When the cutter stops at the end of the shaving cycle another limit switch is tripped causing the arbor to retract and the gear carrier to return to loading position. The next gear being moved into shaving position pushes the finished gear onto a chain conveyor which carries it to a stock tray or to another conveyor, as desired.

During the shaving operation, 0.005-in. of stock (measured over two pins) is removed. The 23-tooth gear is shaved at a rate of 240 per hour with output of the 28 tooth gear being slightly lower.

Nameplates:

Aluminum sheet, photographic process combined.

Name plates, dial faces and many parts requiring resistance to abrasion can be made on thin aluminum sheet photographically sensitized. The sensitized aluminum sheets have a combination of qualities which make them suitable for a variety of applications.

The photosensitive aluminum plate, Metalphoto, has properties equivalent to photographic printing paper. This material is now being manufactured on a small scale by Horizons, Inc., Cleveland.

Anodized Sheets

The plates are specially anodized aluminum sheets, treated to produce an oxide pore size suitable for impregnation with photographic compounds. The sheets are made photosensitive by a process developed at Horizons, then packaged in light-proof boxes for distribution.

Photographic sensitivity of the plates compares favorably with commercial contact printing paper. Using average negatives, the exposure time is generally 3 to 10 seconds. With respect to exposure, the nature of the deposition of photochemical products thus provides the ultimate in latitude for printing purposes. The plates have been used for enlarging with arc or mercury vapor lamp light sources.

Can Be Toned

Plates are capable of producing high quality continuous tone photo images as well as high contrast line work. The unexposed background is essentially that of na-

Turn Page

tural metallic aluminum, while light-affected portions show up as shades of blue-black when properly toned.

The degree of resolution characteristic of the plates is unique. It is possible to resolve 1000 lines per millimeter, typical grain sizes being roughly equivalent to Lippmann emulsions.

Electron micrographs have shown the pore size to approximate 0.1 millimicron, grains approaching 1 billion per square inch. This material therefore opens up a new avenue of approach for reproducing extremely fine drawings and precise images photographically.

Aluminum Hydrate Coating

Results of more than 3 years of exposure test under severe conditions have shown no deterioration of original quality. This is attributable to the sealed surface of the plates.

The photographic image is sealed permanently inside a glass-like, clear aluminum hydrate coating which protects the picture from corrosion, abrasion and the actions of outer environment.

Plates are photosensitive on both sides, so that images can be reproduced on the two plate surfaces. Standard methods are used to point and develop the plates.

Must Be Sealed

Toning is required to prevent a brown tone in the final plate. After toning, the plate must be sealed by boiling 30 minutes in a 20 pct solution of Glauber's salt (sodium sulfate). This converts the aluminum oxide layer to a glass-like coating, sealing in the image permanently.

Once sealed, the plates have demonstrated superior corrosion resistance to salt and sea atmospheres, outdoor exposure and in applications involving oily or dirty surroundings. The glass-like surface withstands severe abrasion.

Sorting:

Principle of automatic machine may find industrial use.

A fully automatic machine which can weigh and sort 18,000 coins per hour with an accuracy of ¼ pct has been developed by the National Bureau of Standards. It has high sensitivity, low susceptibility to seismic noise, and independence of physical properties of the coin except diameter, which is held to close tolerances in manufacture.

Present System Limited

The present weighing system used by the Treasury consists in dropping the coin into a basket suspended from the beam of an analytical balance and allowing the beam to come to rest. The beam is then clamped and the coin is ejected into either a high or a low chute.

This process takes about 4 seconds. A limitation on improving the response speed of the balance is the ratio between the mass of the beam and the comparatively small differential mass of the coins, since the small mass will not accelerate the large mass rapidly.

Weighs By Measuring

The machine weighs coins by measuring the degree of unbalance imparted to a rapidly-revolving flywheel into which the standard coin and the one to be weighed have been placed. The difference in weight between the two coins displaces the center of gravity from the geometric center of the wheel. It is likely that this principle will have use in industry for sorting and weighing parts of similar shape.

Sorting by Circuitry

A method has also been developed for injecting the coin into the rapidly-moving flywheel and removing the coin after it has been weighed. Sorting of coins into light and heavy categories is done by circuitry which determines precisely the angle of the wheel at

System is essentially a pendulum with its main mass contained in a 7-in. diam flywheel . . .

which the coin is to be removed so that it will fall in the proper container.

The system is essentially a pendulum, whose main mass is in about a 7-in. diam flywheel. The wheel is mounted at the lower end of a vertical rotating shaft. At the top of the shaft is a gimble mount which serves as the fulcrum, and the dc motor which turns the weighing wheel at 3000 rpm is above it.

Weight Difference Magnified

By rotating the wheel at 3000 rpm with the coins about 2½ inches from the center of the wheel, the small weight differential between the coins is magnified 500-fold. The vector product of the large synthetic acceleration and the small differential mass is the force which causes the wheel to accelerate rapidly into a new orbit about its new center of gravity whenever a coin of unknown weight is placed in the wheel.

Within six revolutions of the wheel, the initial transient disturbance resulting from the loading of a new coin into the periphery of the wheel while it is rotating is damped down. At 3000 rpm, this takes only 0.12 sec. The subsequent constant amplitude of vibration, which determines the difference in weight between the two coins, is made in the two following revolutions.

Transducer Detects Vibration

An electronic mutual-inductance micrometer probe placed near the wheel hub detects the vibration of the pendulum shaft. This device is an extremely sensitive transducer which can determine a change in length as small as 50 microinches and can accurately measure the few thousandths of an inch displacement in the weight-indicating vibration.

Turn Page

Signals Indicate Weight

The coin to be weighed and the standard coin lie on a straight line passing through the geometric center of the wheel. If the coin to be weighed is heavier or lighter than the standard, the center of gravity of the pendulum moves along this line to one side or the other of the geometric center. Thus, the wheel can vibrate in either of two modes which are 180° apart with respect to the time at which the coin in the wheel passes a given point.

A mirror on the rotating shaft reflects a beam of light onto a photocell, generating an electrical pulse each time the coin passes a given point. The photocell signal coincides with either a positive or a negative signal from the transducer once each revolution of the wheel, and the combination of the two signals indicates whether the coin is heavier or lighter than the standard.

Combination of two signals tells whether coin is above or below standard weight . . .

The coin is inserted vertically upward into a hole at the bottom of a hub in the wheel by a poly-iron-core solenoid. Centrifugal force moves the coin into a pocket at the wheel's periphery. By properly controlling the time of insertion into the wheel, the eject phase position is so chosen that the weighed coin may be cast into an "accept" or "reject" receptacle.

Instruments:

Automatic devices boost smelting, mining yield.

Greater use of industrial instruments in smelting and mining operations can markedly increase the metal yield, John R. Green, steel industry manager for the Industrial Div., Minneapolis-Honeywell Regulator Co. recently declared.

One plant, through use of a variety of automatic devices, increased output of lead by 5 pct. In another plant, zinc production controlled by automatic units increased in yield (per ton of ore mined) from less than 90 pct to 92 pct per ton, Mr. Green said.

The nation's growing need for uranium is also stimulating additional application of industrial instruments. He explained that in one uranium mill the use of such instruments improved the control of uranium processing to the extent that the mill saved $5000 per month.

Instrument sales have increased some 10 times in the industry's big modernization and investment programs, it was pointed out. This expansion program, stimulated by high demand and accelerated amortization certificates, will up steel industry capacity to 120 million tons.

The Iron Age
FOUNDED 1855
Markets and Prices

THE IRON AGE SUMMARY...

- **Expect no sharp upturn in spring buying**
- **Auto industry buyers showing little zip**
- **Depression continues in the scrap industry**

While reports of record or near record earnings spurred steel company stock values, hope for a sharp spring upturn in steel buying was growing dimmer this week.

Yet, the market is becoming more stabilized than depressed. It would not be surprising if the steelmaking rate were to stay within the narrow range of the seventies through most of the first half of the year.

The market is intensely competitive. Producers are vying for business by nearly every means they can think of—short of slashing base prices. Actually mill net prices are being shaved closer and closer by freight absorption which is decidedly on the increase. Seasonal factors are again present in the market but are currently being at least partly offset by other market developments. Here are some of the reasons no big upturn in spring buying is expected:

(1) Although steel leaders are still generally optimistic, the more bullish ones have been forced to scale down their estimates of demand. They still expect a "good year" but they don't mean a sharp pickup; a "good year" means more of the status quo.

(2) It would be foolhardy to gamble on a sharp pickup in automotive buying. The auto industry is still steel's No. 1 customer, and it will continue to take nearly a fifth of steel output. But even the biggest and most aggressive auto companies are finding it prudent to shave production to keep from running too far ahead of sales.

Layoff of nearly 20 pct of its workforce by Great Lakes Steel Corp. reflects lack of real zip in auto industry buying. Great Lakes is a large supplier of flat-rolled steel used by the auto industry.

(3) Although mills like to receive orders at least 30 days ahead of rolling, you can get most common carbon steel items on 2 weeks notice. It's inconvenient and bothersome, but mills want the business and they'll expedite to get it. Some mills have already found they can work a lot closer than the paper work tempo to which they became accustomed during years of operation under government controls.

Offsetting some of the disappointments in the market are these points on the brighter side:

(1) Many small and miscellaneous steel users who had been completely out of the market while correcting inventories are placing orders again.

(2) The tough adjustment period for warehouses appears to be nearing an end. Warehouses handle close to a fifth of all the steel sold in the country.

(3) Demand for construction products has held up better than had been expected. This now gives promise of being one of the brightest areas of the market.

The depression in the scrap market continues. This week THE IRON AGE Steel Scrap Composite Price fell another 34¢ a ton to $27.33 a gross ton. Mill scrap holdings are still considerable and buyers can bypass bargains that they once would have snapped up. Scrap dealers don't expect any market change before April. Small sales kept prices at last week's levels in some areas.

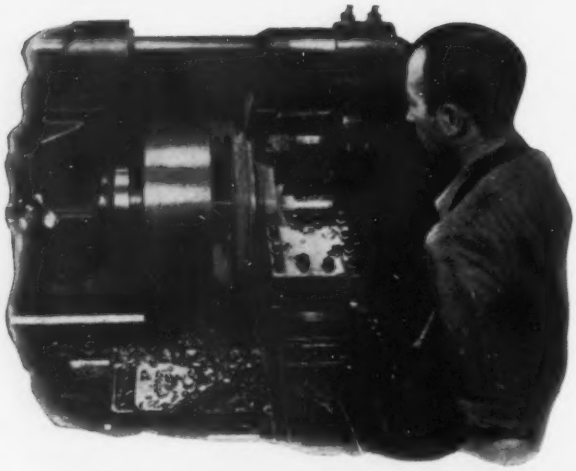
Steelmaking operations this week are again scheduled at 74.0 pct of rated capacity.

Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Net Tons Produced (000 omitted)	**1,762**	**1,802**	**1,798**	**2,202**
Ingot Production Index (1947—49=100)	**109.7**	**112.2**	**111.9**	**137.1**
District Operating Rates				
Pittsburgh	87.0	88.0*	90.0	106.0
Chicago	84.0	84.0*	80.0	92.5
Philadelphia	78.0	78.0	83.0	96.5
Valley	68.0	74.0	71.0	102.0
West	73.0	76.5*	76.5	105.5
Cleveland	78.0	74.0*	81.0	96.5
Buffalo	79.0	71.0	75.0	94.0
Detroit	83.0	83.0*	85.0	101.0
Birmingham	80.5	87.0	95.0	98.5
Wheeling	78.0	74.0*	88.0	101.0
S. Ohio River	74.5	76.0	79.5	93.5
St. Louis	36.5	48.0	67.0	105.5
East	65.5	59.0*	74.5	82.0
Aggregate	**74.0**	**74.0**	**75.0**	**98.0**

Per cent of capacity for weeks in 1954 is based on annual capacity of 124,330,410 net tons as of Jan. 1, 1954. Per cent of capacity for last year is based on annual capacity of 117,547,470 tons as of Jan. 1, 1953.

* Revised.
† Tentative.



. . . the shapers of things to come —

ALLEGHENY LUDLUM HIGH SPEED STEEL TOOL BITS

In a complete range of tungsten, moly, cobalt, and high vanadium types

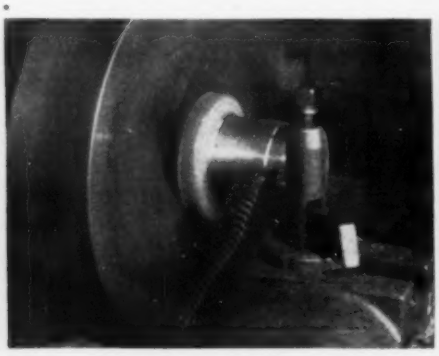
PANTHER 5
SUPER PANTHER
PANTHER SPECIAL
ML, LXX, SUPER DBL
DBL-3 AND DBL-2

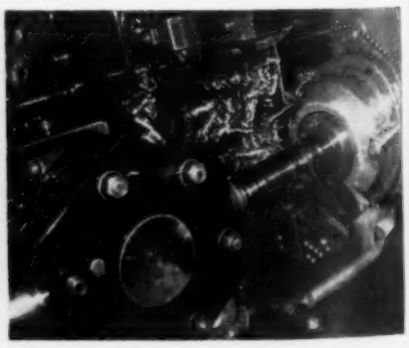
Cut to length . . . bevelled both ends . . . heat-treated to perfection. Just shape the point and you're all ready to go . . . A-L Tool Bits are the last word in convenience.

Made in a complete range of tungsten and moly high speed steels . . . including the new cobalt and high vanadium types that offer superior red hardness, wear-resisting and cutting properties.

Furnished in Standard finish or the popular Ground finish which is extremely accurate in dimension and free from decarburization and scale.

For real Johnny-on-the-spot service on the finest tool bits obtainable, call your local A-L office or distributor . . . TODAY! • *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*





For complete **MODERN** Tooling, call

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W&D 4663.

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FINE TOOL STEELS
SINCE 1854

Markets at a Glance

Plan Titanium Study . . . E. I. Du Pont De Nemours Co., Wilmington, Del., will spend up to $600,000 on design and engineering studies leading to possible construction of a titanium plant of 7000 to 8000 tons annual capacity. General Services Administration has arranged for the preliminary work, but says there is as yet no agreement on building the plant. Studies are needed as a basis for further action. If financing is worked out, the plant will be located in Tennessee, will cost $30-35 million. GSA will repay Du Pont's costs up to $600,000 if engineering is halted by Sept. 1 or if no agreement can be reached. Current GSA-Du Pont contract calls for 13,500 tons of titanium over a 5-year period.

Cut California Lead . . . A $4-per-ton price cut benefits lead users in California effective Feb. 1. American Smelting & Refining Co. has trimmed this price to the St. Louis level of 12.80¢ per lb whereas it was selling the metal at 13.00¢ before.

Buyers See Leveling . . . Cautious purchasing agents generally foresee a leveling off during first quarter, with an upturn possible. January business started slowly but picked up late in the month. Production and orders dipped but at a lower rate than in December, according to the report of the National Assn. of Purchasing Agents. Strong selling efforts were echoed by general price weakness—without any sharp declines. Policy is to buy little more than immediate needs.

Snip Strip Prices . . . The Wallingford Steel Co. has cut prices on two grades of cold-rolled strip. New price, f.o.b. Wallingford, Conn., per 100 lb, for both 0.25 carbon max and under and for 0.26 to 0.40 carbon, is $5.90.

Layoffs Swell Jobless . . . Gadsden, Ala., has been classified as an area of serious unemployment by U. S. Dept of Labor, due principally to layoffs in steel mills, iron foundries and metal fabricating concerns in the area. Republic Steel Corp. has laid off some 1500 workers due to production cutbacks. Its steel ingot production next week will be only 50 pct of rated capacity. Pig iron and coke production also has been cut back. Next largest layoffs are in foundries and textile mills. There also have been layoffs in rubber manufacture and construction.

Banks Furnace . . . Because of decreasing demand, Hanna Furnace Corp. banked the No. 1 furnace at its Buffalo plant last Saturday. Some temporary layoffs resulted. Hanna's No. 3 furnace was blown out Dec. 1, but no layoffs were made at that time. The company operates four furnaces at Buffalo which have a combined yearly capacity of 850,000 net tons.

Cut Steel Price . . . Effective this week, The Stanley Works, Bridgeport, Conn., has set lower prices for several steel items. New prices, per 100 lb, f.o.b. Pittsburgh, are: hot-rolled carbon strip, $3.95; cold-rolled carbon strip, both 0.25 carbon and under and 0.26 to 0.40 carbon, $5.45. In addition, hot-rolled carbon plates and bars were cut 20¢ per 100 lb.

Great Lakes Layoff . . . Slackening demand for steel forced Great Lakes Steel Corp. to lay off 1800 employees last week at its Ecorse, Mich., plant. Merchant and bar mills used on special orders and specialty items, one of four blast furnaces, and bessemer converter operations were shut down temporarily.

Revise Steel Extras . . . Atlantic Steel Co., Atlanta, has revised size and packaging and loading extras for merchant bars, angles, channels, tees, ovals, half ovals and half rounds. New extra lists plus rolling schedules for March, April and May are available from the company.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy. (gross ton)	$27.33	$27.67	$29.67	$42.00
Nonferrous metals				
Aluminum, ingot	21.50	21.50	21.50	20.50
Copper, electrolytic	29.75	29.75	29.75	24.50
Lead, St. Louis	12.80	12.80	13.30	13.30
Magnesium, ingot	27.75	27.75	27.75	24.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	85.00	84.75	85.00	$1.21½
Zinc, E. St. Louis	9.50	9.50	10.00	11.50

Seek Cure for Lead, Zinc Ailments

Mining industry leaders continue to call for more favorable conditions . . . Urge higher tariffs, tax reforms . . . Report western titanium, iron find—*By R. L. Hatschek.*

One way or another, leaders of the American lead and zinc industries last week called for a policy of keeping the mining industry strong and healthy. Occasion was the annual meeting of the Colorado Mining Assn. in Denver.

Andrew Fletcher, president of St. Joseph Lead Co., leveled another blast at imports, again saying they "cannot be considered as a reliable supply." He also went on record as opposing the Randall Commission's recommendations.

This report, Mr. Fletcher said, would "tend to encourage the lessening of the production of raw materials in the United States." The U. S. should have more—not less—production of raw materials, in Mr. Fletcher's view. And again he called for sliding scale tariffs for lead and zinc.

Urges Tax Relief . . . Also opposing imports and the philosophy of stockpiling metals in the ground, Julian D. Conover, executive vice-president of the American Mining Congress, called for tax relief as a major need of the industry. He listed seven tax principles as desirable:

(1) Overall income rate, corporate or individual, should not exceed 50 pct.

(2) Prospecting and exploration costs should be fully deductible.

(3) In carrying over a net operating loss to a year showing a net profit, mining companies should not be penalized by the present tax law provision which virtually disallows percentage depletion in both years.

(4) Depreciation allowances should be more liberal.

(5) Double taxation of corporate earnings, first against the corporation then against the same earnings when received by the stockholder, should be dropped.

(6) New mines should be allowed a tax-free period of at least 3 years from the time they come into production.

(7) Percentage depletion must be continued and liberalized.

Predicts Markets . . . Stressing that market conditions were not the cause of low zinc prices, R. G. Kenly, vice-president of New Jersey Zinc Sales Co., discussed the recent past and probable 1954 use of zinc by major consuming industries.

Galvanizing in 1952 consumed a normal 375,000 tons; Mr. Kenly's estimate for 1953 is 414,000 tons and he predicts a total for 1954 of between 358,000 and 386,000 tons. Trend toward continuous galvanizing lines, he said, could result in increased zinc consumption, particularly in the higher grades.

Zinc diecasting hit a 296,000-ton record last year but is expected to decline in '54 because of lower auto output. But increased use by some 2 to 3 lb per car will help cushion the automotive dip. Brass used some 189,000 tons of zinc in 1953 and this, as well as most other zinc consuming industries, is expected to skid with the overall level of industrial activity.

Titanium Find . . . Also reported at the Denver meeting was the discovery of ore containing iron and titanium near Laramie, Wyo. William Reinhardt, vice-president of the Union Pacific Railroad said that reserves are estimated to total 228 million tons. Some of the ore, he said, averages 19 pct titanium and 46 pct iron, although much of it is of a lower grade than this.

Company geologists believe that the varying intermixture of the iron and titanium minerals will necessitate extensive laboratory work to determine the most economical processing method. Magnetic separation is envisioned. It should be noted that, while the ores may actually be quite different, Quebec Iron & Titanium Co. produces pig iron as a byproduct of its titanium operations.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in January, based on quotations appearing in THE IRON AGE were as follows:

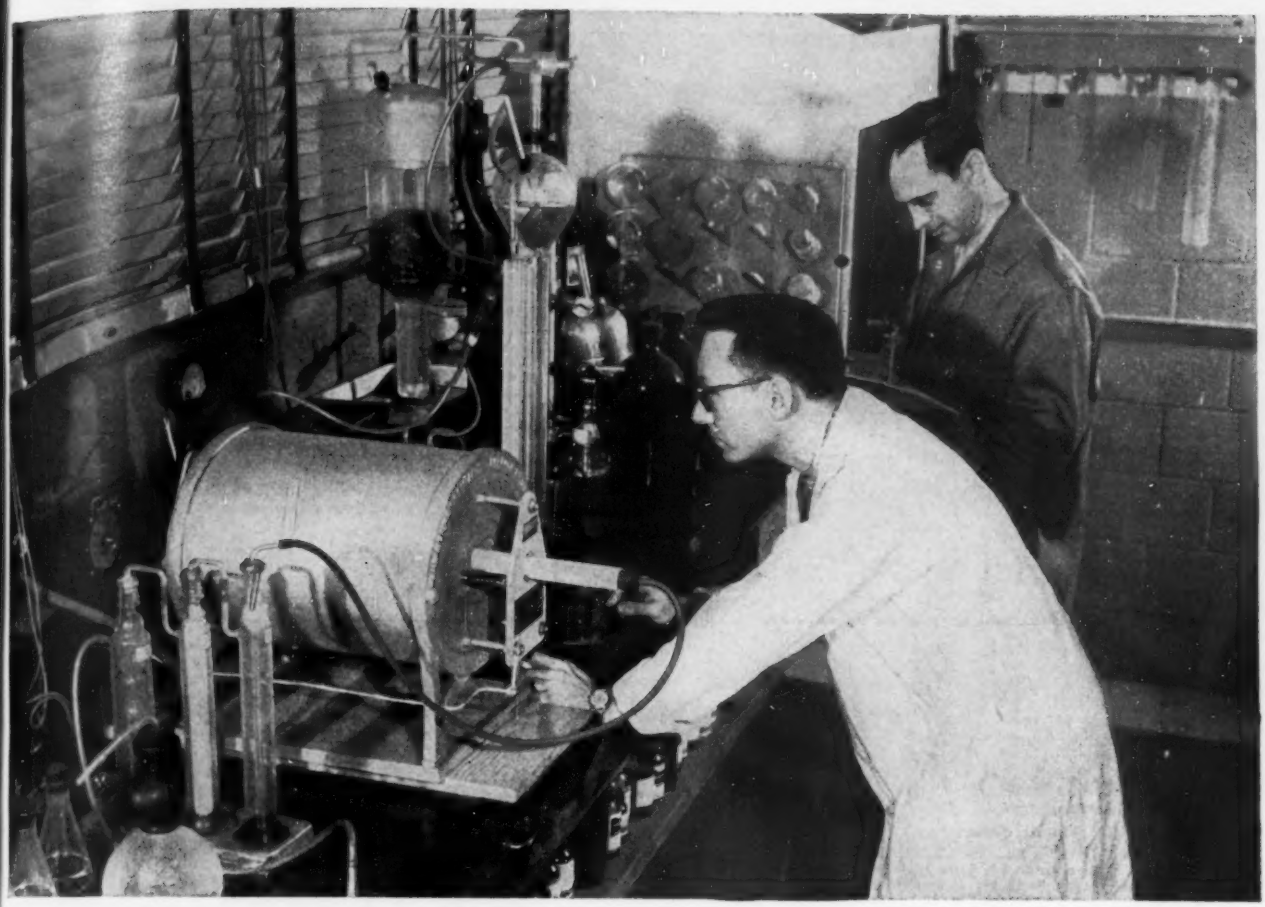
	Cents Per Pound
Electrolytic copper, Conn. Valley	29.750
Lake Copper, delivered	30.00
Straits tin, New York	84.831
Zinc, East St. Louis	9.760
Zinc, New York	10.260
Lead, St. Louis	13.060
Lead, New York	13.260

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Jan. 27	Jan. 28	Jan. 29	Jan. 30	Feb. 1	Feb. 2
Copper, electro, Conn.	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00
Copper, Lake delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	85.125	85.00	85.00	....	85.00	85.00*
Zinc, East St. Louis	9.50	9.50	9.50	9.50	9.50	9.50
Lead, St. Louis	12.80	12.80	12.80	12.80	12.80	12.80

Note: Quotations are going prices
*Tentative



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A product of close Metallurgical CONTROL for the production of stainless steel and alloyed iron

From the original formula to the ingot, control is the most important item in our book. *Alloymet 2115* and its companion alloys are products pre-alloyed to take the "headache" out of the melting department. A single trial in your mill will make you an *Alloymet* "regular."

For further information, write us for our booklet, "Master Alloys."

ALTER COMPANY
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588

Nonferrous Prices

(Effective Feb. 2, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢. 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.5¢ to 82.8¢; 12 to 14, 37.2¢ to 99.0¢; 24 to 26, 39.9¢ to $1.29; 36 to 38, 47.2¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 59.6¢ to 47.0¢; 5/8 to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and plate: FS1-O¼ in., 66¢; 3/16 in., 68¢; ½ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specifications grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅜ to ⅝ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks		60	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41		48.48
Copper, h-r	48.38	44.73	
Copper, drawn		45.98	
Low brass	44.47	44.41	
Yellow brass	41.72	41.66	
Red brass	45.44	45.38	
Naval brass	45.76	40.07	41.33
Leaded brass			39.11
Com. bronze	46.95	46.89	
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36		62.63

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	12.80
Lead, New York	13.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb., pig	27.00
Ingot	27.75
Magnesium, sticks, 100 to 500 lb.	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$187 to $190
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$22 to $24
Platinum, dollars per troy oz.	$90 to $92
Silver, New York, cents per oz.	85.25
Tin, New York	85.00
Titanium, sponge	$5.00
Zinc, East St. Louis	9.50
Zinc, New York	10.00
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	24.50
No. 120	23.75
No. 123	23.25
80-10-10 ingot	
No. 305	28.75
No. 315	26.50
88-10-2 ingot	
No. 210	37.50
No. 215	34.00
No. 245	29.50
Yellow ingot	
No. 405	20.75
Manganese bronze	
No. 421	25.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	22.25-23.00
0.60 copper, max.	22.00-22.75
Piston alloys (No. 122 type)	19.75-21.00
No. 12 alum. (No. 2 grade)	18.50-19.00
108 alloy	19.25-19.50
195 alloy	20.50-21.00
13 alloy (0.60 copper max.)	22.00-22.75
ASX-679	19.00-19.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	20.00-21.00
Grade 2—92-95%	19.25-20.00
Grade 3—90-92%	18.25-19.00
Grade 4—85-90%	16.75-17.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.54
Electrodeposited	38.38
Flat rolled	47.14
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	$1.85
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.90
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	19¾	18
Red brass	23	22¼
Comm. bronze	23⅞	23⅛
Mang. bronze	18¼	17⅜
Yellow brass rod ends	19½	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	22½
Light copper	21
*Refinery brass	20

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24½
No. 2 copper wire	23
Light copper	21½
No. 1 composition	17½—18
No. 1 comp. turnings	17
Rolled brass	14½—15½
Brass pipe	15 —16
Radiators	13½
Aluminum	
Mixed old cast	10 —11
Mixed new clips	11½—12
Mixed turnings, dry	10¾—11¼
Pots and pans	10 —11

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	22½
No. 2 heavy copper and wire	20½
Light copper	18½
New type shell cuttings	18 —18½
Auto radiators (unsweated)	11 —11¼
No. 1 composition	15½—16
No. 1 composition turnings	15 —15½
Unlined red car boxes	13 —13½
Cocks and faucets	13 —13½
Mixed heavy yellow brass	9½—10
Old rolled brass	12½—13
Brass pipe	14½—15
New soft brass clippings	15½—16
Brass rod ends	13 —13½
No. 1 brass rod turnings	10½—11

Aluminum

Alum. pistons and struts	5 — 6
Aluminum crankcases	8 — 9
2S aluminum clippings	11 —11½
Old sheet and utensils	8 — 9
Borings and turnings	5 — 6
Misc. cast aluminum	8 — 9
Dural clips (24S)	9 —10

Zinc

New zinc clippings	4½
Old zinc	3¼
Zinc routings	1¾
Old die-cast scrap	3 — 3¼

Nickel and Monel

Pure nickel clippings	60 —65
Clean nickel turnings	40
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	22 —24
Clean Monel turnings	14 —15
Old sheet Monel	20 —22
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12

Lead

Soft, scrap, lead	9½— 9¾
Battery plates (dry)	5¼— 5½
Batteries, acid free	3¼

Magnesium

Segregated solids	20 —21
Castings	19 —20

Miscellaneous

Block tin	65 —67
No. 1 pewter	40 —42
No. 1 auto babbitt	37 —38
Mixed common babbitt	11 —12
Solder joints	14
Siphon tops	35
Small foundry type	14½
Monotype	13
Linotype and stereotype	12
Electrotype	10½
Hand picked type shells	7½
Linotype and stereo. dross	4½
Electro dross	3

Ingersoll-Rand uses Nickel Alloy Steel Gears

A size 20 Ingersoll-Rand Multi-vane close-quarter drill reaming a one inch hole in a machine bed plate casting. Extremely close quarter operations on much of today's modern machinery has created a demand for powerful tools capable of getting into narrow corners for such operations as drilling and reaming of holes. And it poses the problem of getting gears which are small enough for the job, yet tough enough to transmit high torques. Ingersoll-Rand Company engineers specified a nickel alloy steel for the bevel gears and pinions in that company's pneumatically operated close-quarter drills.

For Increased Strength . . . Heavier Loads . . . Longer Machine Life

Maximum wear resistance . . . greatest surface compressive strength . . . extremely tough cores that withstand shock loads as well as fatigue and bending stresses . . .

These are some of the properties you get in gears fabricated from *nickel alloy carburizing steels.*

Furthermore, distortion that accompanies heat treating . . . a chief cause of noisy gears . . . is inherently resisted by nickel alloy carburizing steels.

Direct hardening nickel alloy steels are used for gears carrying heavy tooth loading in applications where resistance to wear and surface compressive stresses is not quite so vital a factor. Here again, the nickel-containing steels develop the required strength more consistently and in heavier sections than carbon steels, and are generally more resistant to shock, fatigue and multi-axial stresses. Distortion resulting from heat treatment may be minimized by using nickel alloy steels. And, their machinability before final heat treatment is very good.

When you face revised stress analysis due to design changes . . . or changed fabricating methods that demand improved response to heat treating . . . remember that the many standard grades of nickel alloyed steels permit specifying the particular type which provides the best set of properties for any reasonable fabrication and service demands.

Investigate all the benefits nickel alloy steel gears can give you. Send us details of your problems for our suggestions.

INCO

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

Low Movement, High Stocks Cut Prices

Scrap prices continue decline in most areas . . . Mill-stocks stay high . . . Buyer interest virtually nil . . . Iron Age Composite drops to $27.33 . . . Will March orders bolster market?

The best that can be said of the scrap market this week was that in some areas it is about holding its own. Not that its own has been anything to brag about lately, but in other districts the market continues to weaken.

At its best, movement is at a trickle, and frequently nonexistent. Prices continue to decline, with THE IRON AGE Steel Scrap Composite off another 34¢ to $27.33. Mill inventories of both ore and scrap are still formidable.

In those areas where prices have stayed roughly at last week's levels, it has generally been on the basis of small sales which have taken on new significance in the currently moribund market. There are faint flickers here and there of buyer interest, but generally the trade expects another glum month, and many see little chance of relief before April orders are placed.

Pittsburgh — Openhearth material held unchanged this week, although the market continues weak. Low phos is off $1 to $32, top. Railroad and cast scrap is weaker. A leading crusher reduced buying price of machine shop turnings $1, but short turnings are unchanged on basis of a small sale at $19. A large mill reportedly is laying down its home scrap in order to reduce purchased scrap stockpiles, particularly material that has been lying in the open for many months.

Chicago—With scrap movement continuing at a trickle, old differentials were beginning to appear in Chicago scrap levels. A mill purchase last week failed to stabilize the market, since industrial grades only were purchased. Industrial No. 1 heavy brought $28 on a relatively small tonnage sale, but dealer grades went begging. In the wind is a further drop in turning grades. No. 2 dealer grades in bundles and heavy melting are largely asking prices, and an increasing number of brokers and dealers frankly don't know where to peg their asking price.

Philadelphia—Even the most optimistic members of the trade in this area do not foresee any pickup for the next 2 months. And pessimists feel the gloomy aspects may continue throughout the year. Prices were generally quiet this week in the absence of any real business. Some turnings grades did slip a bit.

New York—No. 1 and No. 2 steel declined another $1 on appraisal in the absence of any buying. No. 2 bundles dropped $3 per ton on the basis of a small sale which was virtually the only activity in that grade. A small sale of machine shop turnings brought prices for blast furnace grades down $2.

Detroit—A new slump in local steel production and closing of one of the city's blast furnaces brought further gloom to this market. Industrial lists were off $2 to $3 from the previous month and the trade believed that much industrial scrap would have to be laid down. Yards in Detroit are loaded and mill inventories are at levels unheard of since 1949. Most steelmaking and blast furnace grades dropped at least $1 on the strength of token sales.

Cleveland—One Valley consumer is reported releasing shipment on about 20 cars of scrap per week. Releasing coupled with on-car sales of industrial bundles at $26 has kept prices from shifting downward. Consumers have sharpened pencils and are busy comparing scrap and hot metal costs. If fear of drastic price rebound can be quieted mill consumption may pick up. Slowness in Detroit is still having a very depressing effect on the market here.

Birmingham — Very little scrap moved to steel mills in the South this week due, brokers say, principally to cutbacks in production. Some scrap was moving to northern mills, however, principally from the Carolinas. Cast continues strong at unchanged prices, with foundries taking just about everything that is ordered.

St. Louis—This market continues dull. Only buying is from regular sources and in small tonnages, as offered, with no quantity commitments in sight as mill inventories are up. Result is prices are generally lower.

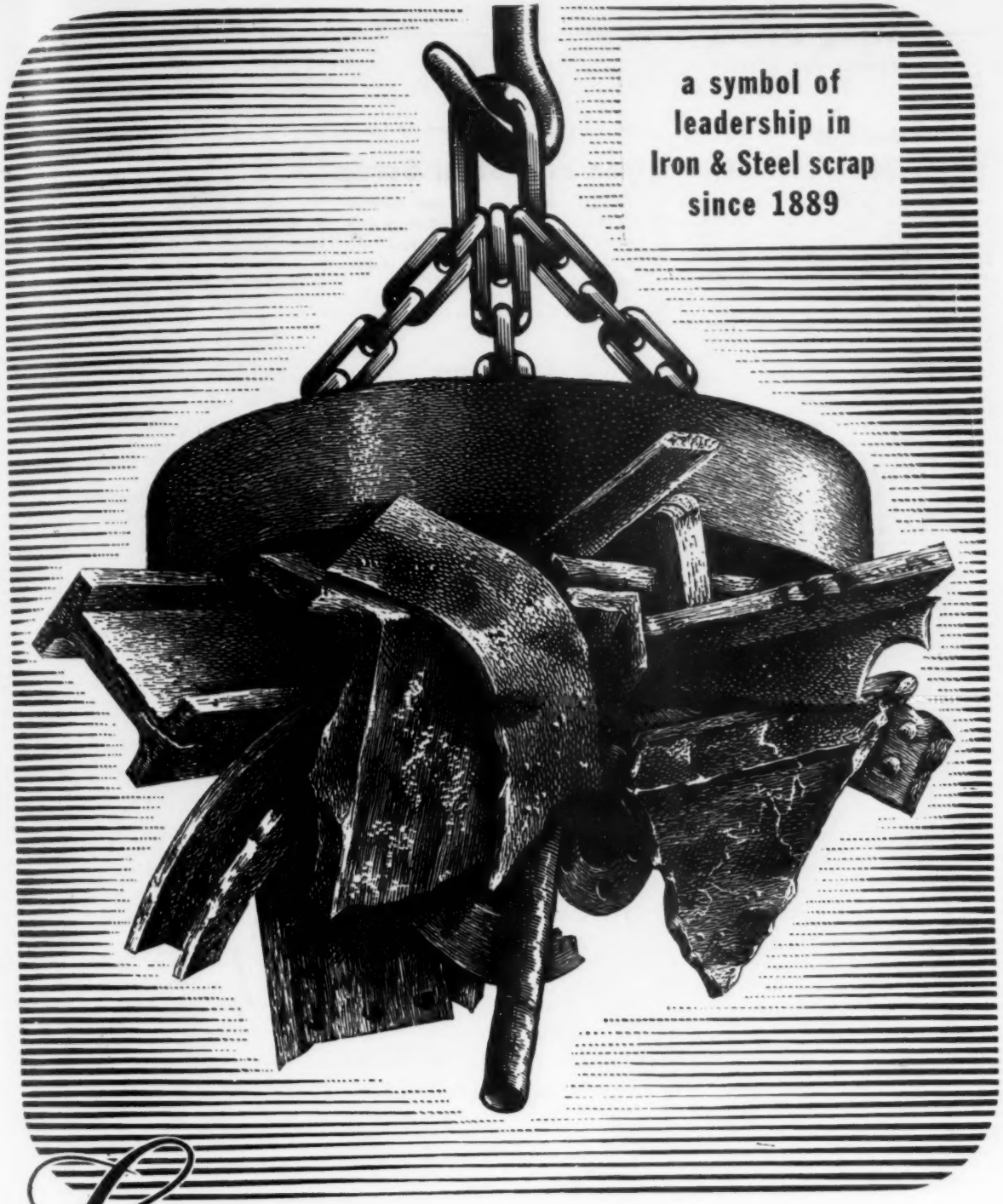
Cincinnati — No. 1 heavy melting dropped $2 to $24 as mill buyers indicated prices they will be willing to pay in February. All other openhearth grades, low phos and heavy breakable cast went down in proportion. Dealer resistance to new buying prices is strong, should weaken.

Buffalo — Leading foundries have joined top mill buyers on the market sidelines as prices of steelmaking and blast furnace items fell another $1 a ton here. Dealers are reluctant to bid on new offerings, as yard stocks are heavy. Weather conditions have slowed some collections.

Boston—New month started with old orders just about cleaned up and nothing but question marks facing the trade. Results were declines from already low prices. No. 1 steel is now quoted at $16 to $17, No. 2 bundles $10 to $11, machine shop turnings $2 to $3.

West Coast — Total movement of scrap in the 11 western states during January was estimated at only about 40,000 tons compared to the 1951-52 heyday of about 150,000 tons monthly. Re-entrance of one coast buyer last week at reduced prices was only flurry of activity. Yards in remote areas were beginning to feel pinch. One good-sized yard in San Diego closed operations last week indefinitely.

Hamilton, Ont.—Market across the border continues very soft. This week prices dropped on all categories. Price of No. 1 heavy melting was off $3 to $26, and a similar drop brought No. 2 down to $23. No. 2 bundles suffered the steepest price decline, dipping $5 to $21.



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Scrap Prices

(Effective Feb. 2, 1954)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and ms. turns.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs, plate	31.00 to 32.00
Heavy turnings	26.00 to 27.00
No. 1 RR. hvy. melting	30.00 to 31.00
Scrap rails, random lgth.	38.00 to 39.00
Rails 2 ft and under	44.00 to 45.00
RR. steel wheels	32.00 to 33.00
RR. spring steel	32.00 to 33.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	42.00 to 43.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	30.00 to 31.00
Malleable	31.00 to 32.00

Chicago

No. 1 hvy. melting	$25.00 to $27.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 factory bundles	27.00 to 29.00
No. 1 dealers' bundles	24.00 to 26.00
No. 2 dealers' bundles	19.00 to 21.00
Machine shop turn.	9.00 to 11.00
Mixed bor. and turn.	9.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Low phos. forge crops	33.00 to 34.00
Low phos. punch'gs, plate	29.00 to 31.00
Low phos. 3 ft and under	28.00 to 29.00
No. 1 RR. hvy. melting	28.00 to 29.00
Scrap rails, random lgth.	30.00 to 31.00
Rerolling rails	36.00 to 37.00
Rails 2 ft and under	38.00 to 40.00
Locomotive tires, cut	32.00 to 34.00
Cut bolsters & side frames	32.00 to 33.00
Angles and splice bars	34.00 to 35.00
RR. steel car axles	37.00 to 38.00
RR. couplers and knuckles	32.00 to 34.00
No. 1 machinery cast.	33.00 to 34.00
Cupola cast.	30.00 to 31.00
Heavy breakable cast.	25.00 to 26.00
Cast iron brake shoes	32.00 to 33.00
Cast iron car wheels	29.00 to 31.00
Malleable	36.00 to 37.00
Stove plate	24.00 to 26.00

Philadelphia Area

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	26.00 to 27.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	15.00 to 16.00
Mixed bor. short turn.	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Clean cast chem. borings.	24.00 to 25.00
Low phos. 5 ft and under	30.00 to 31.00
Low phos. 2 ft and under	31.00 to 32.00
Low phos. punch'gs	31.00 to 32.00
Elec. furnace bundles	28.00 to 29.00
Heavy turnings	25.00 to 26.00
RR. steel wheels	32.00 to 33.00
RR. spring steel	32.00 to 33.00
Rails 18 in. and under	40.00 to 41.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	35.50 to 37.50
Cast iron carwheels	38.00 to 39.00
Malleable	39.00 to 40.00
Unstripped motor blocks.	27.00 to 28.00
No. 1 machinery cast.	38.00 to 40.00
Charging box cast.	35.00 to 36.00

Cleveland

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	27.00 to 28.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. 2 ft and under	29.00 to 30.00
Drop forge flashings	27.00 to 28.00
No. 1 RR. heavy melting	30.00 to 31.00
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	44.00 to 45.00
Railroad grate bars	28.00 to 29.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	41.00 to 42.00
No. 1 machinery cast.	41.00 to 42.00
Stove plate	35.00 to 36.00
Malleable	41.00 to 42.00

Youngstown

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. plate	30.00 to 31.00

Buffalo

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	20.50 to 21.50
No. 1 busheling	24.00 to 25.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	12.50 to 13.50
Mixed bor. and turn.	14.50 to 15.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	14.50 to 15.50
Low phos. plate	28.00 to 29.00
Scrap rails, random lgth.	31.00 to 32.00
Rails 2 ft and under	36.00 to 37.00
RR. steel wheels	34.00 to 35.00
RR. spring steel	34.00 to 35.00
RR. couplers and knuckles	34.00 to 35.00
No. 1 machinery cast.	34.00 to 35.00
No. 1 cupola cast.	29.00 to 30.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$19.00 to $20.00
No. 2 hvy. melting	17.00 to 18.00
No 1 bundles, openhearth	20.00 to 21.90
No. 2 bundles	17.00 to 18.00
New busheling	19.00 to 20.00
Drop forge flashings	19.00 to 20.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Low phos. punch'gs, plate	21.00 to 22.00
No. 1 cupola cast.	.... 36.00
Heavy breakable cast.	.... 25.00
Stove plate	.... 29.00
Automotive cast.	.... 36.00

St. Louis

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	9.00 to 10.00
Cast iron borings	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
No. 1 RR. hvy. melting	29.00 to 30.00
Rails, random lengths	33.00 to 34.00
Rails, 18 in. and under	38.00 to 39.00
Locomotive tires, uncut	31.00 to 32.00
Angles and splice bars	31.00 to 32.00
Std. steel car axles	35.00 to 36.00
RR. spring steel	31.00 to 32.00
Cupola cast.	37.00 to 38.00
Hvy. breakable cast.	25.00 to 26.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	28.00 to 29.00
Cast iron car wheels	30.00 to 31.00
Malleable	34.00 to 35.00
Unstripped motor blocks.	25.00 to 26.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to $17.00
No. 2 hvy. melting	13.00 to 14.00
No. 2 bundles	11.00 to 12.00
Machine shop turn.	4.00 to 6.00
Mixed bor. and turn.	7.00 to 8.00
Shoveling turnings	8.00 to 9.00
Clean cast chem. borings.	18.00 to 19.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	28.00 to 28.50
Bar crops and plate	31.00 to 32.00
Structural and plate, 2 ft.	31.00 to 32.00
No. 1 RR hvy. melting	26.00 to 27.00
Scrap rails, random lgth.	32.00 to 33.00
Rails, 18 in. and under	38.00 to 39.00
Angles & splice bars	35.00 to 36.00
Std. steel axles	35.00 to 36.00
No. 1 cupola cast.	41.00 to 42.00
Stove plate	38.00 to 39.00
Cast iron car wheels	34.00 to 35.00
Charging box cast.	24.00 to 25.00
Heavy breakable	25.00 to 26.00
Unstripped motor blocks	32.00 to 33.00
Mashed tin cans	15.00 to 16.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to $17.00
No. 2 hvy. melting	12.00 to 13.00
No. 1 bundles	14.00 to 15.00
No. 2 bundles	10.00 to 11.00
No. 1 busheling	12.00 to 13.00
Elec. furnace, 3 ft & under	17.00 to 18.00
Machine shop turn.	2.00 to 3.00
Mixed bor. and short turn.	2.00 to 3.00
Shoveling turnings	7.00 to 8.00
Clean cast chem. borings	13.00 to 14.00
No. 1 machinery cast.	27.00 to 28.00
Mixed cupola cast.	23.00 to 24.00
Heavy breakable cast.	26.00 to 26.50
Stove plate	20.00 to 21.00
Unstripped motor blocks.	10.00 to 11.00

Cincinnati

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	23.00 to 24.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.50 to 14.50
Shoveling turnings	13.50 to 14.50
Cast iron borings	13.50 to 14.50
Low phos., 18 in. & under	31.00 to 32.00
Rails, random lengths	35.00 to 36.00
Rails, 18 in. and under	43.00 to 44.00
No. 1 cupola cast.	36.00 to 37.00
Hvy. breakable cast.	31.00 to 32.00
Drop broken cast.	43.00 to 44.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Cast iron borings	9.00
No. 1 RR, hvy. melting	23.00
No. 1 cupola cast.	$39.00 to 40.00

Los Angeles

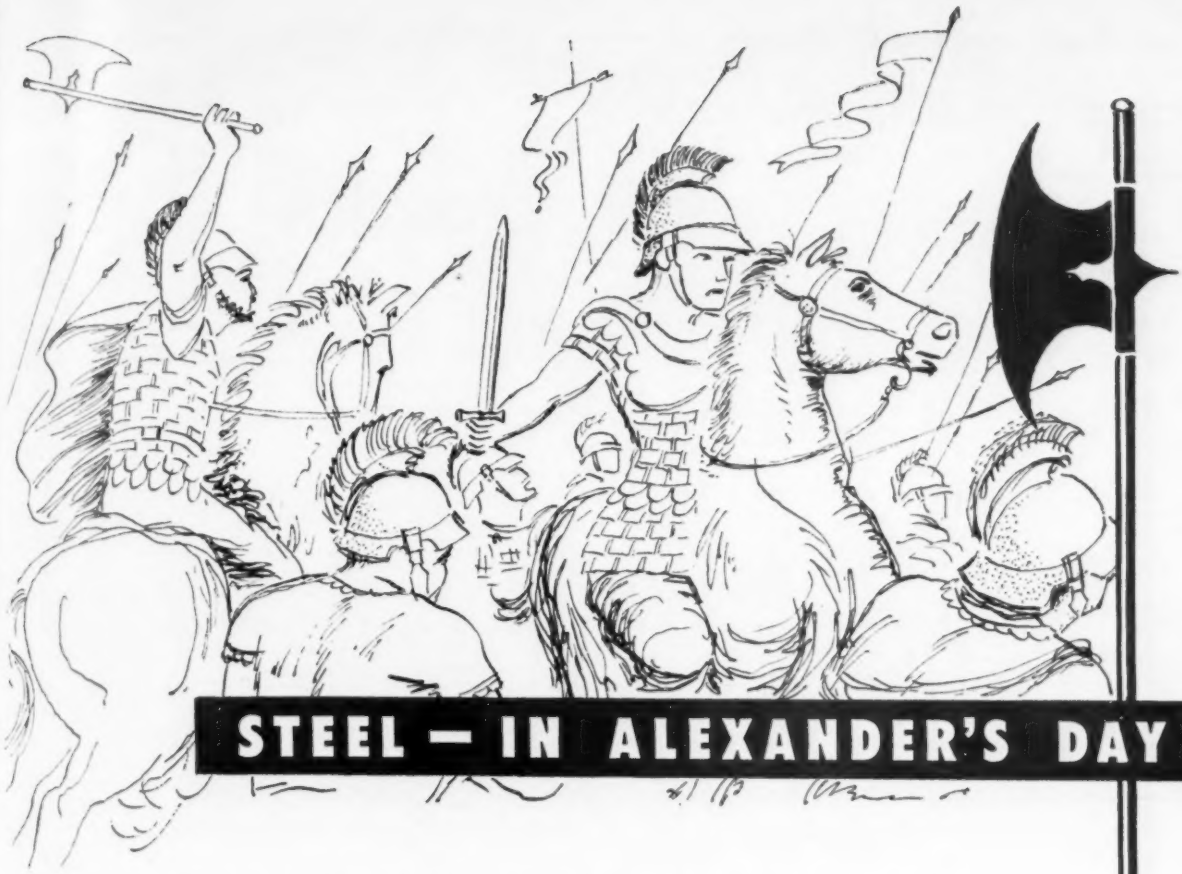
No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Shoveling turnings	$7.00 to 9.00
Cast iron borings	7.00 to 9.00
Elec. fur. 1 ft and under	25.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	39.00 to 40.00

Seattle

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	21.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	12.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$26.00
No. 2 hvy. melting	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Bushelings	21.00
Bush., new fact prep'd.	24.00
Bush., new fact. unprep'd.	20.00
Short steel turnings	15.00
Mixed bor. and turn.	15.00
Rails, remelting	35.00
Cast scrap	42.00



STEEL — IN ALEXANDER'S DAY

When the armies of Alexander the Great defeated the Persians at Arbela in 331 B.C., steel already had its specialized uses.

According to Daimachus, a writer of the fourth century B.C., Chalybdic and Synoptic steels were used for ordinary tools; Lydian for swords, razors and surgical instruments; Lacedaemonian for files, augers, chisels and stone-cutting implements.

Today, steel requirements for specialized purposes are far more extensive—for implements and tools—for agriculture, industry, construction, transportation and defense. Scrap, in millions of tons, is required to maintain the continuity of our vitally important steel production.

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Comparison of Prices

(Effective Feb. 2, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

	Feb. 2 1954	Jan. 26 1954	Jan. 5 1954	Feb.3 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.513	5.513	5.513	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	36.75*
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. ternes	7.75	7.75	7.75	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.16¢	4.16¢	4.16¢	3.95¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	31.50*
Wrought iron bars	10.40	10.40	10.40	10.05
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$3.775
Light rails	5.20	5.20	5.20	4.25
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$59.00
Slabs, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slabs	82.00	82.00	82.00	76.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.376¢

* Add 4.7 pct.

	Feb. 2 1954	Jan. 26 1954	Jan. 5 1954	Feb.3 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$60.69
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago†	56.50	56.50	56.50	55.00
Basic del'd, Philadelphia	60.27	60.27	60.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago†	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	9.06¢

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis.

Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$55.26
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$29.50	$29.50	$30.50	$42.00*
No. 1 steel, Phila. area	26.50	26.50	29.00	41.50*
No. 1 steel, Chicago	*26.00*	27.00	29.50	41.50*
No. 1 bundles, Detroit	*20.50*	21.50	22.50	41.15*
Low phos., Youngstown	30.50	30.50	31.50	46.50*
No. 1 mach'y cast, Pittsburgh	*42.50*	43.50	43.50	52.00
No. 1 mach'y cast, Philadel'a.	39.00	39.00	40.50	52.00
No. 1 mach'y cast, Chicago	*33.50*	34.50	36.50	47.00

*** Basing pt., less broker's fee. † Shipping pt., less broker's fee.**

Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$27.33*	$27.67	$29.67	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.75‡	29.75‡	29.75‡	24.50
Copper, Lake, Conn.	30.00	30.00	30.00	24.625
Tin, Straits, New York	85.00†	84.75*	85.00	91.21½
Zinc, East St. Louis	9.50	9.50	10.00	11.50
Lead, St. Louis	12.80	12.80	13.30	13.30
Aluminum, virgin ingot	21.50	21.50	21.50	20.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.75	27.75	27.75	24.50
Antimony, Laredo, Tex.	28.50	28.50	28.50	34.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	63.00	63.50	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for .85 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1*, *G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50–20.75	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50–46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75–59.00	45.75–46.00	51.25	30.00	30.50–31.00	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *I4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

How to Fabricate More Profits

This is a story of small change that put folding money in the pockets of a half-dozen fabricators of metal products.

The small change is that of specifying Carpenter Stainless Tubing rather than just "stainless tubing" . . . the folding money is attested by the captions under the pictures at the left.

What is more important to you, however, is the fact that none of the orders were for "specials" . . . all of these pieces were made from "mill run" tubing as delivered by Carpenter.

The moral of the story is, of course, that there *is* a difference in Stainless Tubing—and Carpenter makes it. Why not make the most of this *provable* difference in your own shop—for your own profit. Call your nearest Carpenter Distributor for your next order of tubing . . . plus design and engineering help if you need it. "One Call Does It All."

The Carpenter Steel Company, Alloy Tube Division, Union, N.J.
Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.
"CARSTEELCO"

Carpenter

STAINLESS TUBING & PIPE

more than corrosion resistance

Analysis → Tolerance → Finish →

• guaranteed on every shipment

STEEL PRICES

(Effective Feb. 2, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$82.00 *B3*		4.15 *B3*	6.20 *B3*	4.15 *B3*						
	Buffalo, N. Y.	$62.00 *B3*	$75.50 *B3,* *R3*	$82.00 *B3, R3*	4.925 *B3*	4.15 *B3*	6.20 *B3*	4.15 *B3*	3.925 *B3, R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Claymont, Del.													
	Conshohocken, Pa.													
	Coatesville, Pa.													
	Harrison, N. J.								4.05 *A2*		5.90 *A2*			
	New Bedford, Mass.									6.00 *R6*				
	Johnstown, Pa.	$62.00 *B3*	$75.50 *B3*	$82.00 *B3*		4.15 *B3*	6.20 *B3*							12.00 *C11*
	Morrisville, Pa.													
	New Haven, Conn.									5.90 *D1* 6.20 *A5*				
	Phoenixville, Pa.					4.15 *P2*		4.95 *P2*						
	Sparrows Pt., Md.								3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Wallingford, Conn.									5.90 *W1*				
	Worcester, Mass.									6.30 *A5*				12.30 *A5* 12.45 *N7*
MIDDLE WEST	Alton, Ill.								4.10 *L1*					
	Ashland, Ky.								3.925 *A7*					
	Canton-Massillon, Dover, Ohio		$75.50 *R3*	$82.00 *R3*										12.00 *G4*
	Chicago, Ill.	$62.00 *U1*	$75.50 *R3, U1,W8*	$82.00 *U1, W8,R3*	4.925 *U1*	4.10 *U1, W8*	6.175 *U1, Y1*	4.10 *U1*	3.925 *A1, W8*	5.70 *A1*	5.95 *R3*		6.40 *W8*	
	Sterling, Ill.													
	Cleveland, Ohio		$75.50 *R3*							5.45 *A5,J3*		7.80 *J3* 8.15 *A5*		12.00 *A5* 12.15 *N7*
	Detroit, Mich.		$78.50 *R5*	$84.00 *R5*					4.125 *G3* 4.15 *M2*	5.65 *D1,D2, G3,M2, P11*	6.15 *G3*	7.90 *D2* 8.35 *G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*	4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*		3.925 *I3, U1,Y1*	5.70 *I3*	5.95 *U1, I3* 6.45 *Y1*		6.40 *U1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Mansfield, Ohio													
	Middletown, Ohio									5.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								3.925 *S1*	5.45 *S1,T4*	5.95 *S1*	7.65 *S1*	6.40 *S1*	12.00 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$62.00 *U1, J3*	$75.50 *J3, U1*	$82.00 *U1, C11*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.10 *U1*	3.925 *A7,P6* 3.95 *S7* 4.425 *S9*	5.45 *B4,J3, S7*		7.80 *J3*	6.40 *S9* 6.45 *S7*	12.00 *S9* 12.15 *S7*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.35 *W3*			3.925 *W3*	5.45 *F3, W3*	5.95 *W3*	8.15 *W3*		
	Youngstown, Ohio			$82.00 *Y1, C10*		4.10 *Y1*	6.675 *Y1*		3.925 *R3, U1,Y1*	5.45 *R3,Y1* 5.95 *C5*	5.95 *U1, R3* 6.45 *Y1*	7.60 *R3* 8.30 *Y1*	6.40 *U1*	12.00 *C5*
WEST	Fontana, Cal.	$70.00 *K1*	$83.50 *K1*	$101.00 *K1*		4.75 *K1*	6.825 *K1*	5.30 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*		7.80 *K1*	13.65 *K1*
	Geneva, Utah		$75.50 *C7*			4.10 *C7*	6.175 *C7*							
	Kansas City, Mo.					4.80 *S2*	6.875 *S2*		4.625 *S2*		6.65 *S2*		7.10 *S2*	
	Los Angeles, Torrance, Cal.		$94.50 *B2*	$102.00 *B2*		4.80 *B2, C7*	6.85 *B2*		4.675 *B2, C7*	7.50 *C1*			7.60 *B2*	
	Minnequa, Colo.					4.55 *C6*			5.025 *C6*					
	San Francisco, Niles, Pittsburg, Cal.		$94.50 *B2*			4.75 *B2* 4.91 *P9*	6.80 *B2*		4.675 *B2, C7*					
	Seattle, Wash.		$94.50 *B2, S11*			4.85 *B2*	6.90 *B2*							
SOUTH	Atlanta, Ga.								4.175 *A8*					
	Fairfield, Ala. Alabama City, Ala.	$62.00 *T2*	$75.50 *T2*			4.10 *R3, T2*	6.175 *T2*		3.925 *R3, T2*		5.95 *T2*			
	Houston, Tex.		$85.50 *S2*	$92.00 *S2*		4.60 *S2*			4.425 *S2*				6.80 *S2*	

Entries identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

(Effective Feb. 2, 1954)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
										† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Bethlehem, Pa.
3.925 *B3*	4.77 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*				Buffalo, N. Y.
													Claymont, Del.
													Coatesville, Pa.
4.05 *A2*					5.90 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
12.00 *C11*									4.525 *B3*				Johnstown, Pa.
4.025 *U1*	4.875 *U1*									$8.80 *U1*	$7.50 *U1*		Morrisville, Pa.
													New Haven, Conn.
													Phoenixville, Pa.
3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.825 *A5*				Worcester, Mass.
12.30 *A5* 12.45 *N7*													Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.925 *A7*		5.275 *A7*	5.175 *A7*										Ashland, Ky.
		5.275 *R1, R3*						5.05 *R1*					Canton-Massillon, Dover, Ohio
3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4, R3*				Chicago, Joliet, Ill.
									4.625 *N4*				Sterling, Ill.
3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3, R3*	7.225 *J3, R3*			4.525 *A5*				Cleveland, Ohio
4.125 *G3* 4.15 *M2*	4.975 *G3*				6.10 *G3*	7.425 *G3*							Detroit, Mich.
3.925 *N5*													Newport, Ky.
3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1* 5.325 *I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.125 *G2*	4.975 *G2*	5.475 *G2*	5.875 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
4.025 *C9*		5.375 *C9*						5.025 *C9*					Kokomo, Ind.
				5.675 *E2*				5.05 *E2*					Mansfield, Ohio
	4.775 *A7*		5.175 *A7*	5.675 *A7*									Middletown, Ohio
3.925 *S1* 5.175 *N3*	5.80 *N3*	5.275 *N3*	6.525 *N3*	5.45 *S1* 5.675 *N3*	5.90 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.925 *J3, U1, P6, A7*	4.775 *J3, U1, P6*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa. Butler, Pa.
									4.525 *P7*				Portsmouth, Ohio
3.925 *W3, W5*	4.775 *W3, W5* 5.775 *F3*	5.275 *W3, W5*		5.675 *W3, W5*	5.90 *W3*	7.225 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.10 *F3, W5*	Weirton, Wheeling, Follansbee, W. Va.
3.925 *R3, U1, Y1*	4.775 *R3, Y1*				5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.70 *K1*	5.875 *K1*				6.675 *K1*	8.275 *K1*			5.325 *K1*				Fontana, Cal.
4.025 *C7*													Geneva, Utah
								4.775 *C6*	4.865 *S2*				Kansas City, Mo.
4.625 *C7*		6.275 *C7*							5.325 *B2*				Los Angeles, Torrance, Cal.
									4.775 *C6*				Minnequa, Colo.
4.625 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2* 5.225 *R3*	4.525 *T2 R3*	$8.80 *T2*	$7.50 *T2*		Fairfield, Ala. Alabama City, Ala.
4.425 *S2*									4.925 *S2*				Houston, Texas

IRON AGE

STEEL PRICES

(Effective Feb. 2, 1954)

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r's. Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.325 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3* 4.18 *R3*	4.15 *B3,R3*	5.25 *B5*	4.875 *B3,R3*	6.325 *B3,B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.							4.20 *C4*		5.55 *C4*		
	Coatesville, Pa.							4.20 *L4*		5.55 *L4*		
	Conshohocken, Pa.							4.25 *A2*	5.15 *A2*		6.25 *A2*	
	Harrisburg, Pa.							4.10 *C3*	5.15 *C3*			
	Hartford, Conn.			5.75 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Morrisville, Pa.	4.30 *U1*	4.30 *U1*		5.025 *U1*							
	Newark, N. J.			5.65 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.65 *P10*		6.50 *P10*						
	Putnam, Conn.			5.75 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5* 6.10 *W11*		6.775 *B5*						5.825 *A5, W6*
	Readville, Mass.			5.75 *C14*								
MIDDLE WEST	Alton, Ill.	4.35 *L1*										5.70 *L1*
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio	4.15 *R3*		5.20 *R2,R3*	4.875 *R3, T5*	6.325 *R2,R3, T5*						
	Chicago, Joliet, Ill.	4.15 *U1, N4,W8* 4.22 *R3*	4.15 *R3,N4*	5.20 *A5,W10, W8,B5,L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10,L2, R3,B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A1, R3,N4,W7*
	Cleveland, Ohio	4.21 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5, C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5* 4.35 *G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	4.975 *R5* 5.075 *G3*	6.425 *R5* 6.475 *P8* 6.525 *B5,P3*	6.425 *G3*	4.30 *G3*			6.45 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.							4.30 *G2*				
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.25 *N4*	4.25 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.55 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5,J3, W10,R3,C8*	4.875 *U1,C11*	6.325 *A5,C11, W10,C8*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5, J3,P6*
	Portsmouth, Ohio											5.525 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.15 *W3*						4.10 *W3*				
	Youngstown, Ohio	4.15 *U1, Y1* 4.20 *R3*	4.15 *R3, U1, Y1*	5.20 *Y1,F2*	4.875 *U1, Y1, C10*	6.325 *Y1, C10,F2*	6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Emeryville, Cal.	4.90 *J5*	4.90 *J5*									
	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.85 *S2*	4.85 *S2*		5.575 *S2*		6.925 *S2*					6.125 *S2*
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					6.475 *B2*
	Minnequa, Colo.	4.60 *C6*	4.75 *C6*					4.95 *C6*				5.775 *C6*
	Portland, Ore.	4.90 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2,N6*	4.90 *B2,S11*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.40 *A8*	4.40 *A8*									5.725 *A8*
	Fairfield, Ala. Alabama City, Ala.	4.15 *T2* 4.18 *R3*	4.15 *R3,T2*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.375 *S2*			4.50 *L3* 4.60 *S2*				5.925 *S2*

Steel Prices

(Effective Feb. 2, 1954)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Morrisville *N2*	24.25		27.25		29.75		32.25		32.75		33.25		34.75									
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 9.50¢.

Steel Prices

(Effective Feb. 2, 1954)

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*32.7	
Washington, Pa., *J3*	....	
Claymont, Del. *C4*	....	
New Castle, Ind. *I2*	....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa. *L4*	37.5	
Inconel-carbon		
10 pct. Coatesville, Pa. *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa. *L4*	38.90	
Aluminized steel sheets, hot dip, Butler, Pa., *A7*	....	....

* Includes annealing and pickling, sandblasting.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $111.80 to $115.30
6 to 24-in., del'd N. Y... 115.00 to 116.00
6 to 24-in., Birmingham 98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less ..... $129.50 to $131.50
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	8.75	9.75	10.65	11.60	12.15	12.65
Brackenridge *A3*	....	8.75	9.75	10.65	11.60	.....	12.65
Granite City *G2*	....	8.55	9.80	.....	.....	.....	.....
Ind. Harbor *I3*	8.15	8.75	9.75	.....	.....	.....	.....
Mansfield *E2*	8.15	8.75	9.75	10.65	.....	.....	.....
Newport, Ky. *N5*	8.15	8.75	9.75	10.65	11.60	.....	.....
Niles, O, *N3*	8.15	8.75	9.75	.....	.....	.....	.....
Vandergrift *U1*	8.15	8.75	9.75	10.65	11.60	12.15	12.65
Warren, O. *R3*	8.15	8.75	9.75	.....	.....	.....	.....
Zanesville *A7*	8.15	8.75	9.75	10.65	11.60	12.15	12.65

TOOL STEEL

F.o.b. Mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.48
18	4	1	—	5	2.16
18	4	2	—	—	1.64
1.5	4	1.5	8	—	.895
6	4	2	6	—	1.005

High-carbon chromium ..... .70
Oil hardened manganese ..... .39
Special carbon ..... .355
Extra carbon ..... .30
Regular carbon ..... .25

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann'ld	Merch. Wire* Galv.
	Col	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	131	140	...	149	...	153	6.675	7.075
Aliquippa, Pa. *J3*	131	143	...	...	...	150	6.675	7.20
Atlanta *A8*	133	145	...	151	...	158	6.775	7.30
Bartonville *K2*	131	143	...	...	...	156	...	...
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago, Ill. *N4*	131	143	...	149	156	156	6.675	7.20
Cleveland *A6*	137	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.675	...
Crawfordsvl. *M4*	133	145	...	151	...	153	6.775	7.325
Donora, Pa. *A5*	131	140	...	149	...	153	6.675	7.075
Duluth *A5*	131	140	145	149	...	158	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	...	153	6.675	7.075
Galveston *D4*	139	148	...	...	...	...	...	...
Houston *S2*	139	151	...	...	...	164	7.075	7.625
Johnstn., Pa. *B3*	131	143	145	...	156	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	...	153	6.675	7.075
Kokomo, Ind. *C9*	133	142	...	151	...	155	6.775	7.175
Los Angeles *B2*	...	...	...	...	...	...	7.625	...
Kansas City *S2*	143	159	...	161	...	168	7.275	7.825
Minnequa *C6*	136	148	150	154	162	162	6.925	7.325
Monessen *P6*	131	145	...	...	...	157	6.675	7.225
Moline, Ill. *R3*	...	...	145	...	...	...	...	...
Pittsburg, Cal. *C7*	150	163	...	173	173	173	7.625	8.025
Portsmouth *P7*	132	...	...	...	...	...	6.575	...
Rankin, Pa. *A5*	131	140	...	...	...	153	6.675	7.075
So. Chicago *R3*	131	140	145	149	...	153	6.675	7.075
S. San Fran. *C6*	...	...	...	...	...	173	...	...
Sparrows Pt. *B3*	133	...	...	151	158	158	6.775	7.325
Struthers, O. *Y1*	...	...	...	...	...	...	6.675	7.175
Worcester *A5*	137	...	...	...	...	...	6.975	...
Williamsport, Pa. *S10*	133	...	158	...	...	...	...	...

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa. (*A2*).
* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	5.75	7.65	8.60	10.55	12.85
Carnegie, Pa. *S9*	.....	7.65	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D1*	5.65	7.85	8.45	10.55	.....
Detroit *D2*	5.65	7.85	8.80	.....	.....
Harrison, N. J. *C11*	.....	.....	8.90	10.85	13.15
New Castle, Pa. *B4*	5.80	8.00	8.60	.....	.....
New Haven, Conn. *D1*	5.90	7.95	8.55	10.65	.....
Riverdale, Ill. *A1*	5.70	7.80	8.75	10.70	13.00
Sharon, Pa. *S1*	5.45	7.65	8.60	10.55	12.85
Trenton *R4*	.....	7.95	8.90	10.85	13.15
Wallingford *W1*	6.20	7.95	8.90	10.85	13.15
Warren, Ohio *T4*	5.45	7.65	8.60	10.55	12.85
Weirton, W. Va. *W3*	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. *A5*	6.30	7.95	8.90	10.85	13.15
Youngstown *C5*	.....	8.00	8.60	10.55	12.85

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	 B.W. Ga.	Seamless H.R.	 C.D.	Elec. Weld H.R.	 C.D.
Babcock & Wilcox	2	13	30.08	36.28	26.51	31.98
	2½	12	40.51	48.86	35.70	43.07
	3	12	45.92	55.39	41.23	49.73
	3½	11	53.60	64.65	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National Tube	2	13	.....	32.98	26.51	.....
	2½	12	36.82	44.41	35.70	.....
	3	12	42.52	51.28	41.23	.....
	3½	11	49.63	59.87	48.13	.....
	4	10	65.91	79.50	63.92	.....
Pittsburgh Steel	2	13	27.34	32.98	.....	.....
	2½	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3½	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.20	7.64	7.78	7.00	.....	6.85	6.98	6.86	8.17	.....	.....	.....	.....
Birmingham	.15	6.15	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.75	.....	.....	.....	.....
Boston	.20	6.89	7.83	9.18	7.13	9.23–9.35[2]	7.13	7.06	6.87	8.36	.....	12.05	.....	14.50
Buffalo	.20	6.20–6.35	7.15–7.70	9.00–9.01	6.65–6.79	.....	6.65–6.68	6.55–6.59	6.35	7.70	.....	11.95	.....	14.25
Chicago	.20	6.18	7.12	8.00	6.42	.....	6.33–6.38	6.46	6.28	7.30	.....	11.75	.....	14.25
Cincinnati	.15	6.51	7.19	8.42	6.72	.....	6.80	6.93	6.58	7.66	.....	12.17	.....	14.87
Cleveland	.20	6.18	7.12	7.90	6.58	.....	6.50	6.79	6.34	7.40	.....	11.89	.....	14.39
Denver	.....	7.95	8.85	10.47	8.20	9.55	7.95	7.95	8.05	9.05	.....	16.05	.....	15.75
Detroit	.20	6.35–6.45	7.29–7.31	8.27	6.69–7.71	7.36	6.80	6.91–6.93	6.56	7.60	.....	11.92	.....	13.44–14.62
Houston	.20	7.15	7.60–7.85	9.40	7.45	.....	7.28	7.35	7.45	9.30	.....	12.95	.....	.....
Kansas City	.20	6.85	7.79	8.67	7.09	.....	7.00–7.05	7.13	6.95	8.08	.....	12.42	.....	.....
Los Angeles	.20	7.25	9.00	9.35	7.55	10.75–11.30	7.20	7.35	7.15–7.25	9.10–9.75	13.20	13.05	15.75	15.85–16.05
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	7.89–8.31	.....	.....	.....	.....
Milwaukee	.20	6.35	7.12	8.00–8.17	6.59–6.60	8.07	6.50–6.55	6.61–6.63	6.45	7.57	.....	11.92	.....	14.42
New Orleans	.15	6.51	7.41	9.32	6.63	10.42	6.73	6.81–7.45	6.60	8.42–10.42	.....	.....	.....	.....
New York	.30	6.78	7.75[4]–8.20	8.42–9.00[3]	7.16	9.85	6.99	6.90	7.06	8.43	12.29	12.14	14.54	14.64
Norfolk	.20	6.90	.....	.....	7.20	.....	7.15	7.20	7.20	8.50	.....	.....	.....	.....
Philadelphia	.25	6.53	7.55	8.15	7.02	.....	6.63	6.67	6.87	8.24	12.04	11.89	14.29	14.39
Pittsburgh	.20	5.95–6.18	6.82–7.12	7.95–8.00	6.20–6.55	.....	6.03–6.33	6.07–6.46	5.98–6.28	7.65	.....	11.45–11.75	.....	13.75–14.25
Portland	.10	8.15–8.95	8.70–9.85	9.40	7.90	.....	7.55	7.50	7.60	10.05	.....	.....	.....	.....
Salt Lake City	.20	9.05	10.80	10.65	9.35	11.25	8.70	8.85	9.10–9.20	11.25	.....	.....	.....	.....
San Francisco	.20	7.35	8.70	9.90–10.15	7.60	10.35	7.20	7.25	7.15	9.75–9.85	13.20	12.80–13.05	15.50	15.55–16.05
Seattle	.20	8.15	9.50	9.80	8.00	.....	7.60	7.50	7.60	10.65	.....	13.40	.....	16.00
St. Louis	.20	6.48	7.42	8.30	6.72	8.47	6.73	6.86	6.58	7.50–7.70	12.20	12.05	12.20	14.55
St. Paul	.15	6.84	7.78	8.66	7.08	.....	6.99	7.12	6.94	8.06	.....	12.42	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb. (2) 20,000 lb or over. (3) 450 to 1499 lb. (4) 500 to 9999 lb. (5) 1000 lb or over. (6) 400 to 1499 lb.

—Miscellaneous Prices—

(Effective Feb. 2, 1954)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.325	5.20	5.275	....	....	....	....
Chicago *R3*	....	....	....	7.05	....	....	....
Cleveland *R3*	....	....	....	....	....	....	....
Ensley *T2*	4.325	5.20	....	....	....	....	....
Fairfield *T2*	....	5.20	....	....	....	5.125	....
Gary *U1*	4.325	5.20	....	....	....	5.125	....
Ind. Harbor *I3*	4.325	....	5.275	7.05	....	5.125	....
Johnstown *B3*	....	5.20	....	....	....	....	....
Joliet *U1*	....	5.20	5.275	....	....	....	....
Kansas City *S2*	....	....	....	7.30	....	....	11.00
Lackawanna *B3*	4.325	5.20	5.275	....	....	5.125	....
Lebanon *B3*	....	....	....	7.05	10.50	....	11.00
Minnequa *C6*	4.325	5.70	5.275	7.05	....	5.125	11.00
Pittsburgh *O1*	....	....	....	....	10.50	....	11.00
Pittsburgh *P5*	....	....	....	....	10.50	....	11.00
Pittsburgh *J3*	....	....	....	7.05	....	....	....
Pitt'g, Cal. *C7*	....	....	....	....	....	5.275	....
Seattle *B2*	....	....	....	7.55	....	5.275	11.50
Steelton *B3*	4.325	....	5.275	....	....	5.125	....
Struthers *Y1*	....	....	....	....	....	....	....
Torrance *C7*	....	....	....	....	....	5.275	....
Youngstown *R3*	....	....	....	7.05	....	....	....

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	....

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
24	84	20.50
20	72	20.00
12, 14, 18	72	20.50
7 to 10	60	21.00
6	60	23.25
4	60	26.00
3	40	27.25
2½	40	28.00
2	24	43.50
	CARBON	
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

—Miscellaneous Prices—

(Effective Feb. 2, 1954)

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List			
	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	+2	15	+2	18
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	18	+20	net
¾ in. to 1½ in. inclusive	+6	12	+25	+4
1⅝ in. & larger	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	9
1⅝ in. & larger	+16	3	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	23	+8	10
1⅝ in. & larger	+14	5	+20	net

	Light	
7/16 in. & smaller	33	43
½ in. thru ⅝ in.	26	37
¾ in. to 1½ in. inclusive	18	30

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $8.50

Pct Off List

7/16 in. and smaller 80

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
¾ in. thru 1 in. up to & including 6 in. 26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
¾ in. thru 1 in. up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in.	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	23
Plow bolts	30	..

—Miscellaneous Prices—

(Effective Feb. 2, 1954)

REFRACTORIES

Fire Clay Brick	*Carloads, per* 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$109.00
No. 1 Ohio	102.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	102.00
No. 2 Ohio	93.00
Ground fire clay, net ton, bulk (except Salina, Pa. add $1.50)	16.00

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$115.00
Childs, Hays, Pa.	120.00
Chicago District	125.00
Western Utah	131.00
California	138.00
Super Duty Hays, Pa., Athens, Tex., Windham	132.00
Curtner, Calif.	150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	19.00
Silica cement, net ton, bulk, Hays, Pa.	21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	20.00
Silica cement, net ton, bulk, Utah and Calif.	28.50

Chrome Brick	*Per net ton*
Standard chemically bonded Balt.	$86.00
Standard chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick	
Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite	*St. %-in. grains*
Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., in bulk	38.00
in sacks	43.75

Dead Burned Dolomite	*Per net ton*
F.o.b., bulk, producing points in: Pa., W. Va., Ohio	$14.50
Midwest	14.60
Missouri Valley	13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content

72½%	$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags	11.25¢
Canadian sponge iron, del'd. in East	12.0¢
Domestic sponge iron, 98+% Fe, carload lots	18.0¢
Electrolytic iron, annealed, 99.5+% Fe	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	60.0¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	43.50¢
Copper, reduced	43.50¢
Cadmium, 100-199 lb 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	21.75¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$5.35
Zinc, 10 ton lots	17.5¢ to 25.0¢

—Ferroalloy Prices—

(Effective Feb. 2, 1954)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.

65-72 Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.35
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75

65-69% Cr, 4.9% C 34.75

62-66% Cr, 4.6% C, 6-9% Si 35.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, bulk 2-in. x down, 24.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 24.90¢ per lb contained Cr plus 12.69¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ⅛ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn:

Producing Point	Cents per lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland Ore.	10.00
Clairton, Pa.	10.00
Sheridan, Pa.	10.00

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	12.50
Ton lots, packed	14.05

Ferroalloy Prices

(Effective Feb. 2, 1954)

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	31.50
Ton lots	33.50
Less ton lots	35.50
Premium for hydrogen-removed metal	1.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.25¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max C, deduct 0.3¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton Lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
65% Si	13.60	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Ferroalloy Prices

(Effective Feb. 2, 1954)

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis f.o.b. Suspension Bridge, N. Y.
Carloads 9.90
Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
Ton lots $6.49
Less ton lots 6.45

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W. ton lots, f.o.b. $3.80

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B ... $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 3-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 16% B 1.20
19% min. B 1.50

Graninal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots 01.46
Less ton lots 1.57

Nickel - Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% Max C, 3.00% max. Fe, balance Ni, delivered
Less ton lots $2.05

Silcar, contract basis, delivered
Ton lots ..... 45.00¢

The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Push Punch Presses . . . Recent establishment of a San Francisco office by Diamond Machine Tool Co. may result in increased used machinery activity in that area. Diamond, one of the major punch press builders in Southern California, will concentrate on new equipment sales at the start but will branch into the used field as soon as it has built up a substantial stock of trade-ins.

Henry Dansereau, manager of the San Francisco office, estimates there are about 3300 mechanical presses in use in the Bay area. This is only 47 pct of the Los Angeles total and comes nowhere near press figures for major industrial areas, but nevertheless Diamond believes San Francisco can provide a substantial market for a local producer. Diamond figures shorter freight hauls to West Coast manufacturers will give it a price advantage over midwestern and eastern pressmakers.

Some western machinery dealers say punch presses are getting up to 80 pct of new press prices, depending on size, age and condition. Currently a used 60-ton unit will go for about $3300 compared to $4000 for a new punch press.

Do It Themselves . . . In the last 9 months the Los Angeles used machine tool market has softened considerably. An important factor in this decline is the fact that aircraft firms are doing more of the work they formerly let out to subcontractors. Result is independent contractors have cut investment in additional machinery. Formation of new one and two-man shops continues but at a much slower pace than a year ago.

Pittsburgh Soft . . . "Get out and sell" is the by-word for Pittsburgh dealers. It's apparent that buyers are not only insisting on quality and lower prices but are also waiting for the seller to come to them rather than vice versa.

Dealers say it is becoming even harder to convert inquiries into sales, and even inquiries are falling off in some fields. Electrical equipment dealers say that no matter what you do the business just isn't there.

One bright spot is the report of a machine tool firm that business is much better now than it was last summer, particularly in sheet metal fabricating equipment—brakes, shears, presses, and the like.

Go On Their Own . . . A lot of inquiries for this type of equipment are from small operators with basement workshops. Why this is so, the dealer isn't sure, but he suspects that some metalworkers may be lining up after-hour business of their own because they're afraid they may be laid off their regular jobs.

Plant disposal business is reported fair. One of the specialists in this field is now selling surplus equipment from two plants and has had a deal hanging fire for more than a month involving disposal of a plant as going business.

Cranes Still Slump . . . Crane business is slow, with the pickup predicted for first quarter showing no sign of materializing as yet. As one dealer put it, "Business isn't too bad, but it's not good either, and even the inquiries are not coming in as they once were."

Potential crane customers are more inclined to bargain, feeling they are now in position to call the tune. The more "depression" talk they hear the more hesitant they become about committing themselves.

Nevertheless, some business is being transacted. A dealer recently disposed of two 2-trolley cranes from an old plant that no longer needed them because of a change in operations. A steel company nibbled at the third but backed out because the crane was too old.